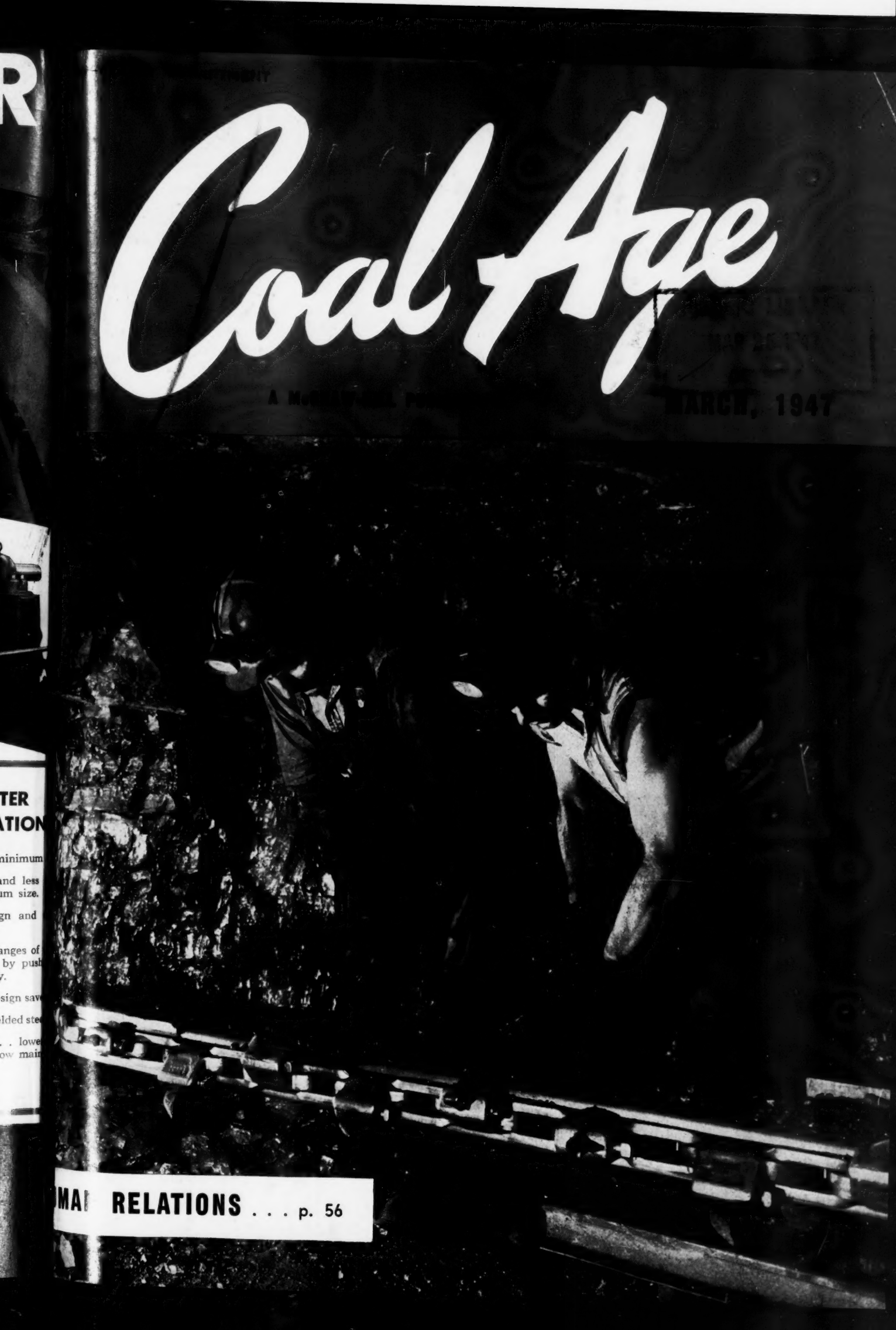
Coal Age

A McGRAW-HILL PUBLICATION

MARCH, 1947



MAI RELATIONS . . . p. 56

Eliminates 86% OF SHUTDOWNS

SUN MINE LUBRICANT . . .

Lasts 7 Times Longer Than Former Grease, Increases Tonnage Loaded

A Pennsylvania mine had this experience on its loading-machines. Greases were separating. Two or three times a week, the transmission-cases and gathering-heads had to be completely cleaned and re-greased.

Tonnage loaded, per machine, went up, however, when they called in a Sun Engineer. He recommended a Sun grease, especially manufactured to withstand the particular conditions in that mine.

Loaders now operate weeks at a time, instead of shutting down every day or so. Higher production and lower maintenance-costs have been the inevitable result.

Mine after mine, where Sun's special mine-lubricants are used, knows the advantages of continuous production, and of holding maintenance-costs down to a minimum. You can put these lubricants, and the specialized experience of Sun men to work for you today. Call the Sun office near you. Or write . . .

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUN

SUNOCO

INDUSTRIAL PRODUCTS

Fish zip through hose — a ton a minute

A typical example of B. F. Goodrich improvement in rubber

FISHERMEN spend days getting a cargo—only to damage and lose as much as a twelfth of their fish, shoveling them from boat to cannery dock. And it takes hours—while fish aren't getting any fresher.

A New England canner, who had seen oil tankers unloaded by B. F. Goodrich hose, came to B. F. Goodrich with the idea that fish might be unloaded the same way.

B. F. Goodrich studied the problem and then recommended a certain kind of hose with a very soft rubber lining so that fish wouldn't be bruised as they had been by the hand method of shoveling. A method was worked out by which fish and water were sucked through the hose, so the water "floated" the fish smoothly.

The new system worked perfectly. Instead of hours by the old method, the B. F. Goodrich hose unloads a 65-ton cargo in minutes—food is saved, fish reach the cannery fresher, boats get back to the fishing grounds sooner. It has made such savings that scores of other fish companies are investigating, and want to adopt it.

Transporting materials of all sorts at lower cost is only one of the many contributions B. F. Goodrich research has made to American industry. Before you're satisfied with any product or process, it pays to find out what developments B. F. Goodrich has been making recently. To find out, call your B. F. Goodrich distributor or write *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

FIRST IN RUBBER

First in its Field....

IT WASHED CLOTHES—
...also cooked soup!

Research seems to indicate that that great American home institution — the Washing Machine — like Topsy, "just growed." Hundreds of different patents were granted. Above is one of its earliest versions, produced about 1850; and the maker claimed that the boiler, when not furnishing hot water for washing, could be used to cook soup stock for the family!

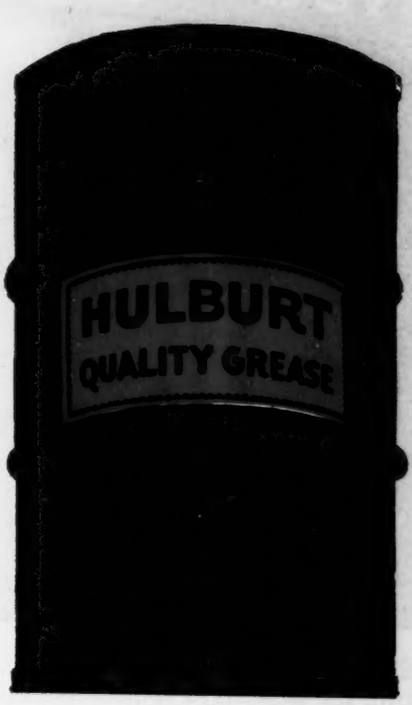
The growth of the use of **HULBURT QUALITY GREASE** is based in the fact that it fills a need of coal mine operators — the proper lubrication of coal mining machinery. A specific QUALITY product for a specific use . . . your lubrication difficulties are "all washed up" when you use HULBURT down-in-the-mine lubrication Engineering Service and HULBURT QUALITY GREASE.

HULBURT OIL & GREASE COMPANY . . PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

..a record of

American Leadership



HULBURT *Quality* GREASE

THE "FIRST NAME" IN

SELECT HAZARD PORTABLE CABLES for protection against fire

Hazaprene Cables meet this new flame-resistance test of Penna. Dept. of Mines which includes application of flame for one minute after the cable has been overloaded 400% and sheath temperature has reached 350 degrees F.

Meeting the new rigid requirements for fire-resistant trailing cables established by the Penna. Dept. of Mines is no problem at Hazard. For several years, all Hazard trailing cables have been built with a Hazaprene jacket made with neoprene to give them high flame-resistance as well as other important qualities. This Hazard jacket fully meets the new requirements of Pennsylvania and now carries the official approval symbol P-104.

And with Hazaprene cable, you can also count on getting all the other life-extending properties you want with trailing cables. You get a tough jacket that's pressure-cured in a continuous metal mold for maximum density, extra surface smoothness, good all-around resistance to mechanical damage. You get a sheath resistant to oil, acids, chemicals, grease and water. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

*Hazaprene Flame-Resistant Twin-Parallel Mining Machine Cable. Penna. Dept. of Mines Approval P-104.

HAZARD

insulated wires and cables for every mining use

4690

Coal Age

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MARCH, 1947

Volume 52 — Number 3

CHANGE OF ADDRESS

Director of Circulation, COAL AGE
330 West 42nd St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

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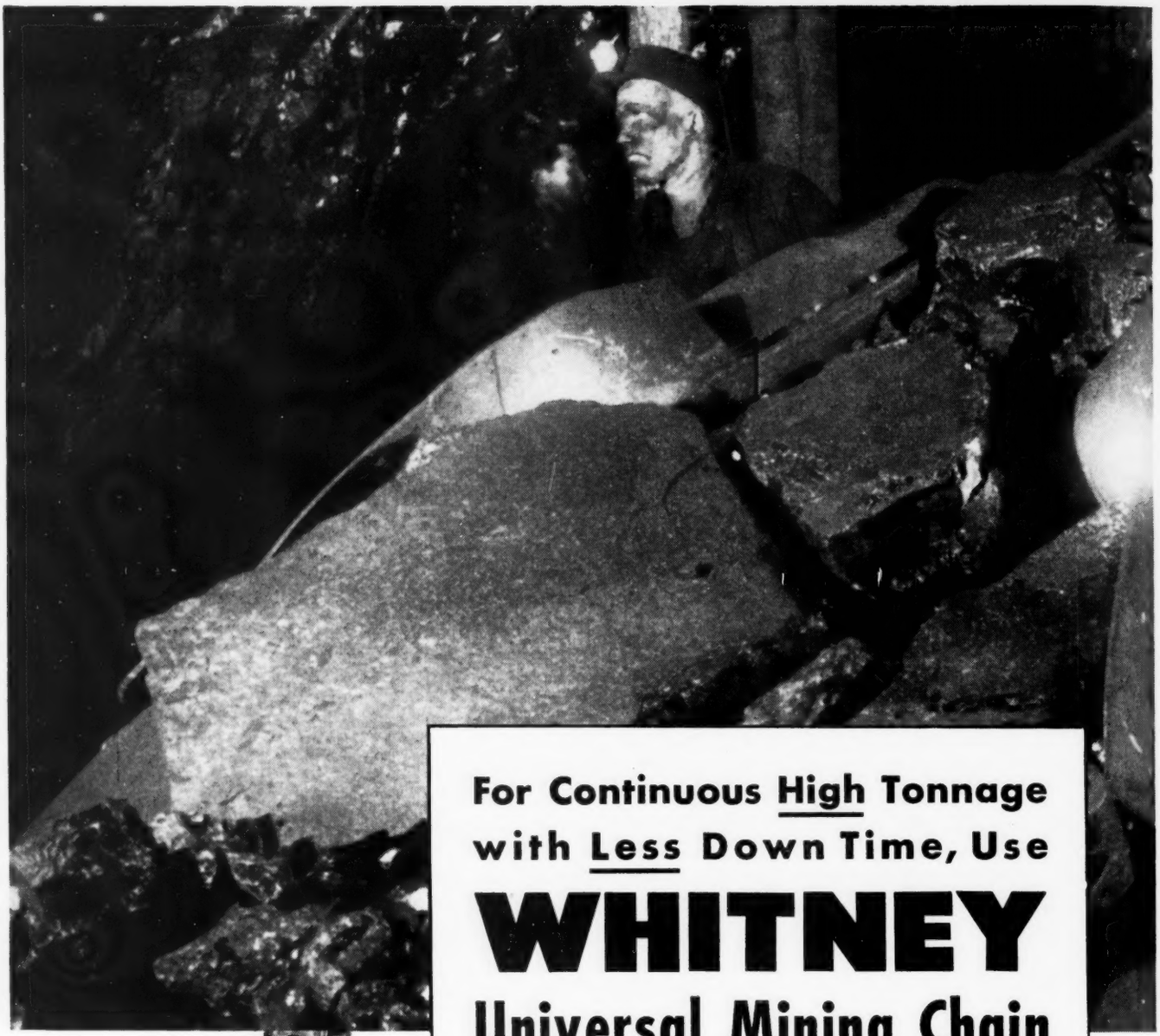
Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....



For Continuous High Tonnage with Less Down Time, Use

WHITNEY

Universal Mining Chain

Where the going is tough, that's where Whitney Universal Mining Chain proves its superiority by out-performing, out-lasting ordinary chain.

For like all Whitney Chains, they're especially made to give long-lasting service in loaders no matter what the working conditions. All parts are made of alloy steel, heat-treated for extreme toughness and durability. The universal joints are made of alloy steel forgings, accurately machined. Flight studs are fully machined and have milled threads. End pins are fully riveted into deep counter-sink in the forging to provide maximum anchorage.

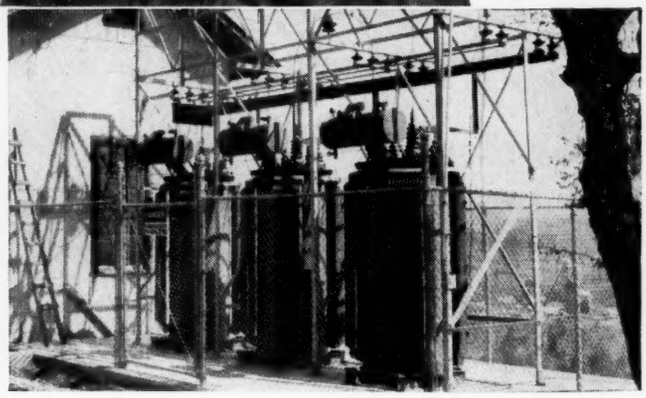
Keep your equipment up-at-the-face producing . . . equip your loaders with Whitney Universal Mining Chains. They will give top performance and save you money with their long operating life.

See the Whitney Distributor serving your territory or write:

The WHITNEY Chain & Mfg. Co.

Your Assurance of Proven Power Transmission and Conveying Since 1896

HARTFORD 2, CONNECTICUT



AUXILIARY EQUIPMENT

THE AMPAC 200 WELDER is a handy, dollar-saving investment for miscellaneous repair work in mine or preparation plant. Magic arc control eliminates weaving flame at high current settings. Ampac is easily adjustable . . . automatically selects the best striking voltage at any amperage setting, with the simple turn of amperage selecting wheel. And Ampac *cuts power costs!* Air gap flux energy is put back to work by means of a reactor coil. Sizes 200 and 400 amp for maintenance work. **BULLETIN B6241B.**

POWER DISTRIBUTION

THESE THREE ALLIS-CHALMERS TRANSFORMERS are designed to meet exacting requirements for mining service . . . step down voltages to 2,400 and 480 volts for primary and secondary power requirements. Allis-Chalmers builds *all* types of distribution and power transformers for *any* requirement — indoor or outdoor installations — oil or Chlorextol non-inflammable liquid filled . . . designed in accordance with ASA and NEMA standards. Find out about design and construction features. Send for **BULLETIN B6168.**

ALLIS-CHALMERS

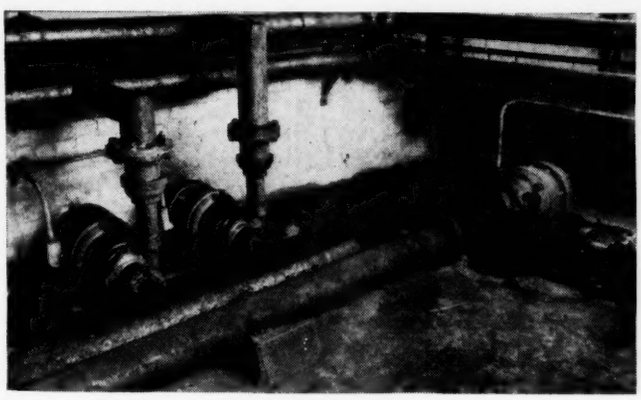
One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

"WHAT DO YOU MEAN .. Two Kinds of Equipment Costs?"

CONSIDER NOT ONLY "How much will it cost?" but also "How much will it cost *if we don't buy it?*" when you plan ahead in coal. Chances are you'll find that "getting by" with half-worn or obsolete equipment will prove more costly than equipment modernization. That's why — in terms of operating efficiency, maintenance costs and pay-off time — new equipment is a sound investment.

This is particularly true when you specify Allis-Chalmers coal processing and power equipment. Job records offer innumerable instances of Allis-Chalmers equipment lowering coal preparation costs . . . providing less troublesome maintenance . . . staying on the job longer despite severe service. Such performance records are the result of years of *unexcelled* experience in building processing equipment in a maximum range of types and sizes.

Plan now to strengthen your position for tomorrow's competition. Contact the A-C office near you. ALLIS-CHALMERS, MILWAUKEE 1, WIS.



CENTRIFUGAL PUMPS

COMPACT SS-UNIT PUMPS, two 300 and one 600 gpm, used in connection with air purification in coal mine. These versatile Allis-Chalmers pumps handle either mine water or preparation plant water . . . internal parts are made of corrosion-resistant materials. Both motor and pump are one unit. Available with standard, enclosed fan-cooled, splash-proof, or explosion-proof Allis-Chalmers squirrel-cage motors. Capacities 10 to 2,500 gpm; heads to 575 ft. Two-stage pumps for high head pumping. **BULLETIN B6059C.**

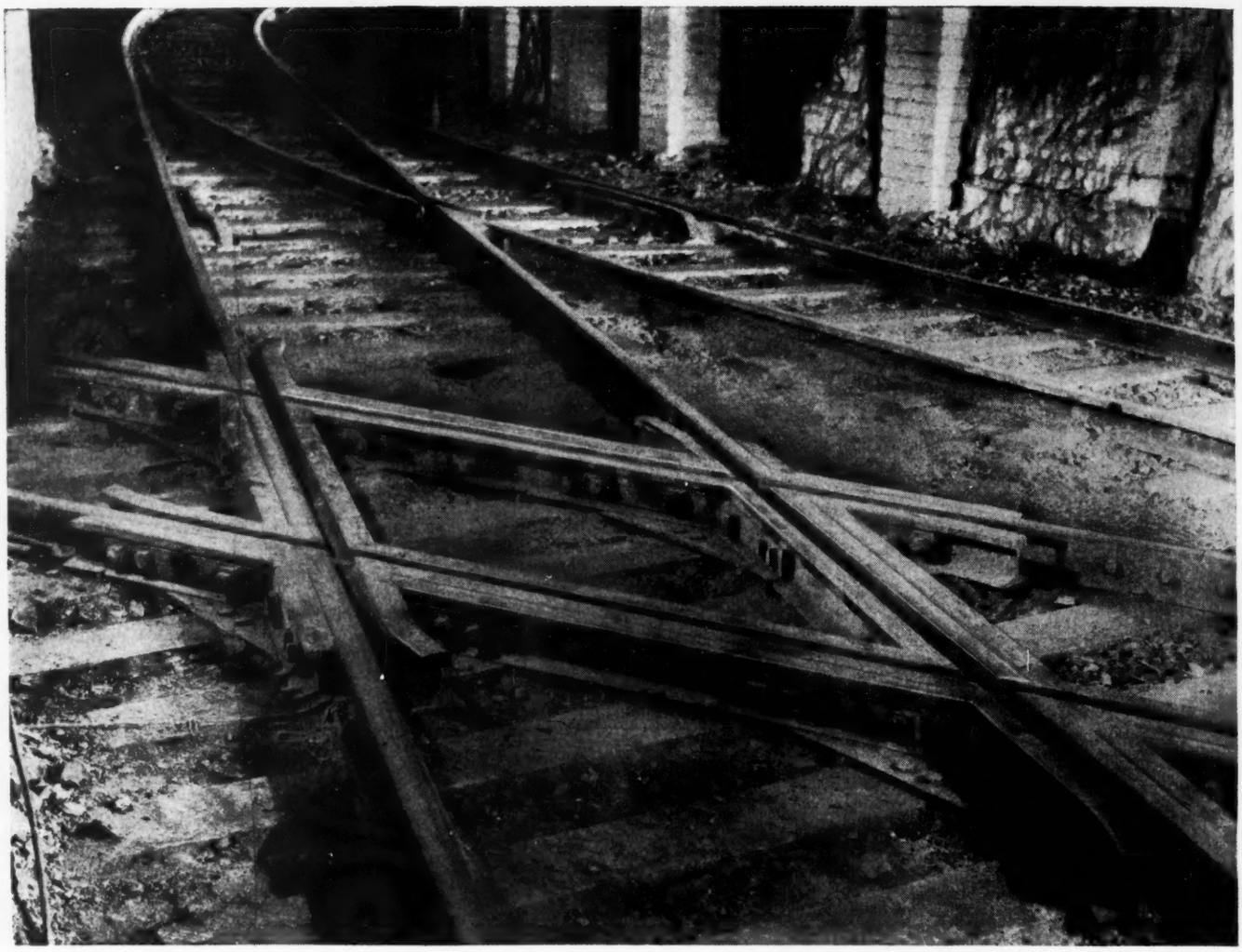
BASIC PROCESSING

WIDE APPLICATION RANGE of the Low-Head Vibrating Screen is the result of two distinct types of screen decks. The End-Tensioned Deck, shown above, is used for sludge dewatering and fine screening down to 35 mesh. Conveying action of screen in combination with deck construction results in increased wet screening and dewatering efficiency. The conventional side tensioned deck is used for screening and dewatering larger size coal. Low-Head sizes range from 3 by 6 to 6 by 16 ft. Send for **BULLETIN B6330.**

A 2198

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

. . . builds for COAL



THE BABY THAT GREW TO BE A GIANT

Years ago, when we first began developing prefabricated track, we naturally encountered a certain amount of the eyebrow-lifting that greets every new idea—an understandable "show me" attitude.

But the idea caught on. Mine operators soon began to recognize its outstanding advantages. Points like these:

★ Each Bethlehem prefabricated-track layout is designed individually, for an individual mine.

★ The trackwork, including all necessary components, is quickly and easily assembled at the mine with a minimum of labor.

★ Once in service, a prefabricated-track system means faster, safer haulage; fewer derailments; greatly reduced maintenance; lower cost per ton of coal moved.

The idea that started life as a baby is now a full-fledged giant—and still growing. If you are considering expansion or revision of your haulage system, prefabricated track can probably point the way to important savings. Why not ask a Bethlehem man to study your workings?

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Bethlehem Prefabricated Track

BETHLEHEM STEEL

GET LONGER BEARING LIFE

. . . Increased Tonnage . . . Lower Costs

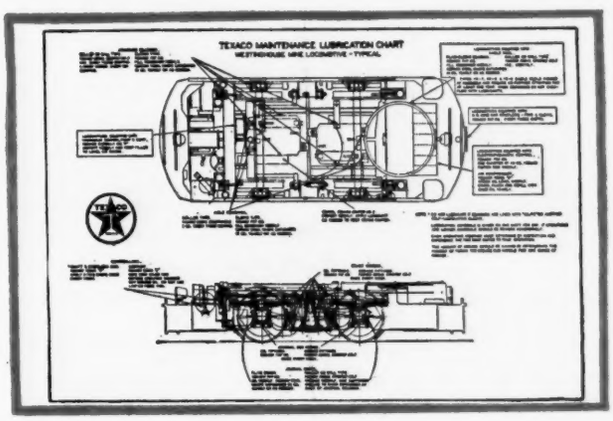
GREASE-LUBRICATED ball and roller bearings in all types of mine machinery last longer, run more efficiently, and *require less maintenance* when lubricated with *Texaco Regal Starfak.*

Texaco Regal Starfak far exceeds every service requirement for an ideal anti-friction bearing lubricant. The qualities that give it this outstanding position are outlined on the opposite page.

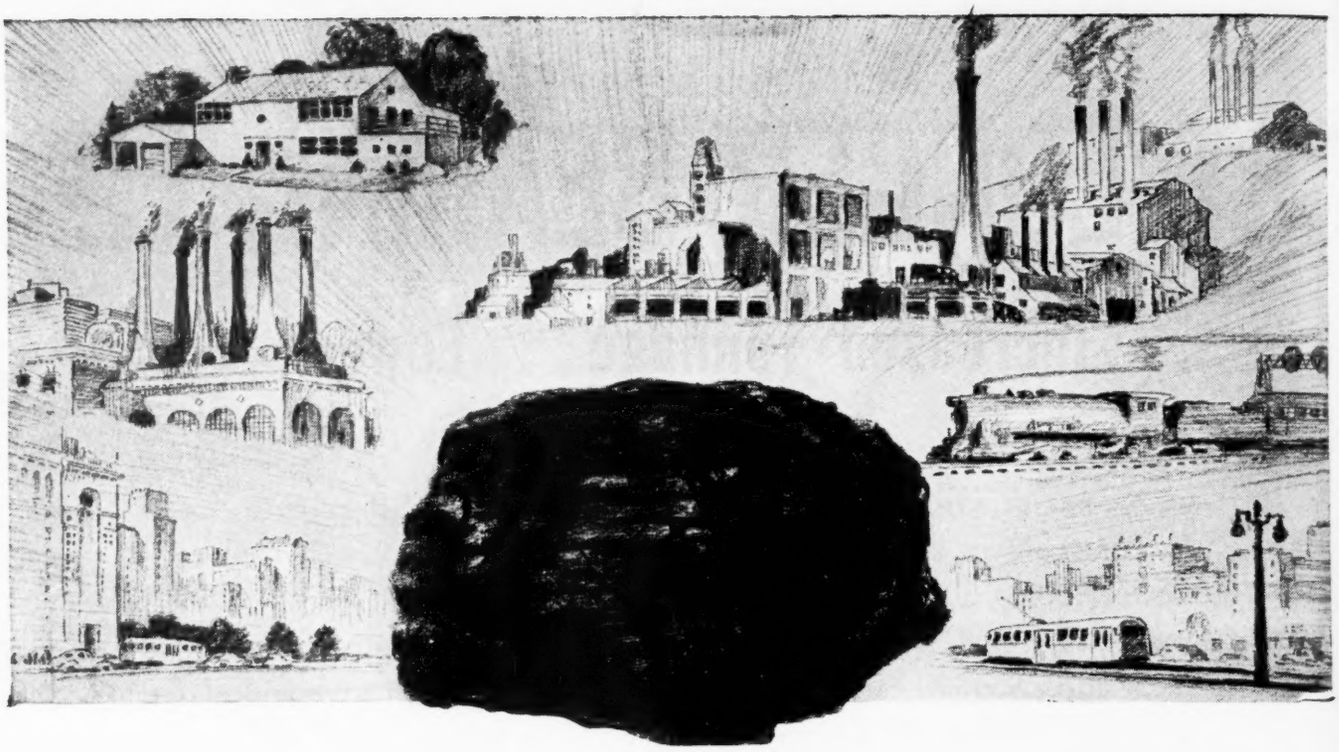
For heavy-duty bearings, both plain and anti-friction, use *Texaco Marfak.* It protects under heavy loads, and under the hammering of rough service.

Using the right lubricant right helps enormously in maintaining efficiency, increasing tonnage and lowering costs. Texaco Lubrication Engineering Service will gladly work with you to this end. Simply call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C.,* 135 East 42nd Street, New York 17, N. Y.

TEXACO MAINTENANCE LUBRICATION CHARTS: Leading manufacturers of underground coal mining machinery approve Texaco products for use on cutters, loaders, locomotives, etc., and have cooperated in preparing these charts. Charts show clearly where and when to use the proper Texaco lubricant. Order the charts you need by make and model of each machine.



For the Coal Mining Industry



Coal Mining Is Big Business

. . . and giving it better explosives is our business

Approximately 620,000,000 tons of bituminous and 60,000,000 tons of anthracite —that's the stupendous amount of coal produced in America annually. Without such production, industrial life as we know it would be impossible—modern comforts would be unattainable.

Last year bituminous operators alone accounted for 47 percent of the power used in this country, 52 percent of our electrical energy. Railroads bought more than one sixth the bituminous output; factories utilized approximately as much. In addition, anthracite fields supplied domestic fuel and power—kept millions of American homes warm and comfortable.

An industry so vital to modern economy is naturally dependent upon modern tools. That's where Atlas explosives come in.

Atlas annually supplies millions of pounds of explosives to the coal industry. Its poundage contribution is a major one, but the *quality* of the explosives is important also. Likewise blasting methods are important—mighty important—and Atlas has made notable contributions to lowered costs and greater safety in coal mining.

Coal is a keystone of American industry, and Atlas is proud of the part it plays in sustaining its importance, increasing its effectiveness.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

COAL-HANDLING— *Modern Style*

ALL through the cycle, from production to consumption of coal, "Caterpillar" Diesel equipment can do many things. Its versatility keeps it profitably occupied. For the mine operator, it has no superior for stripping overburden, ripping, loading and hauling, cleaning up around shovel, building and maintaining haul roads. For either mine operator or industrial user, it is just the thing for stock-moving and piling.

Illustrations: Clam-shells get the coal off the cars. A "Caterpillar" Diesel Motor Grader moves it off the "shelf" into windrows. "Caterpillar" Diesel wheel-type Tractors and Scrapers head the hauling caravan. A "Caterpillar" Diesel track-type Tractor adds "push" in loading the scraper. It also pulls a tamper, to compact the stock-pile and insure against spontaneous combustion and leeching.

Deepening, leveling or extending yard; building and maintaining roadways are further uses for this versatile, money-earning equipment. For the jobs or chores *you* have, get some cost figures from your "Caterpillar" dealer. You can't lose!

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

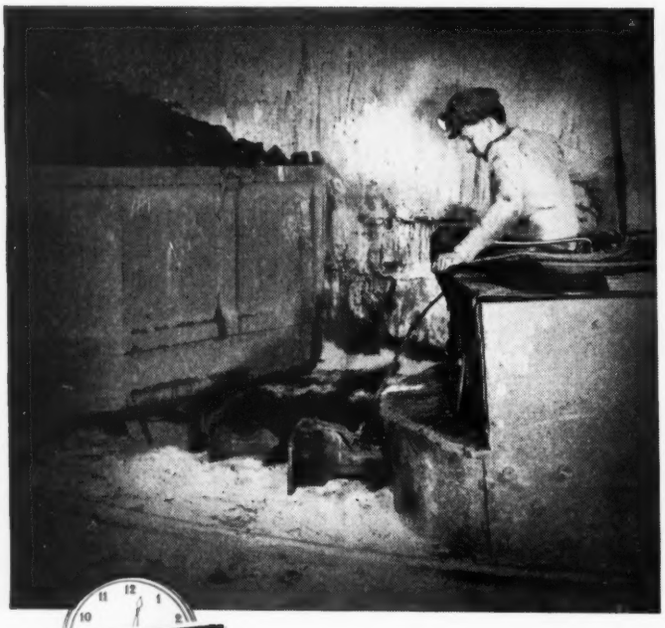
CATERPILLAR

REG U.S. PAT. OFF.

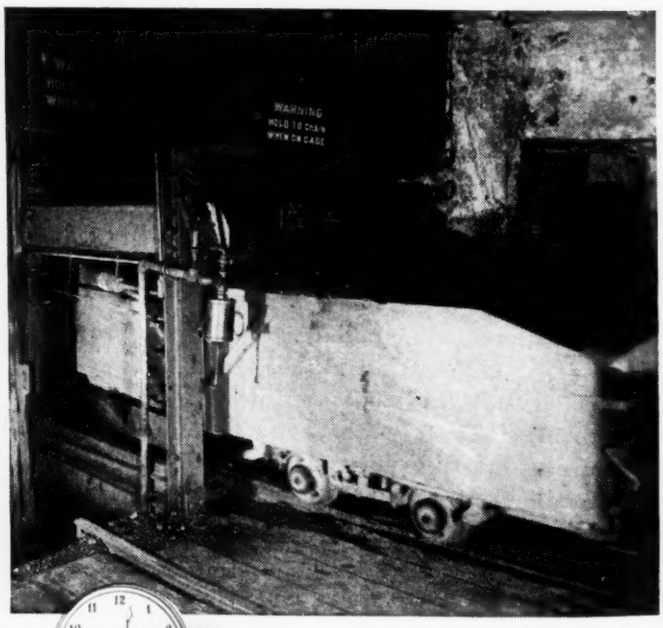
DIESEL

ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

LOADING—4-ton cars equipped with Automatic Couplers move under the loading boom and back into adjacent chutes quickly and easily. All unnecessary time in coupling and uncoupling is eliminated.

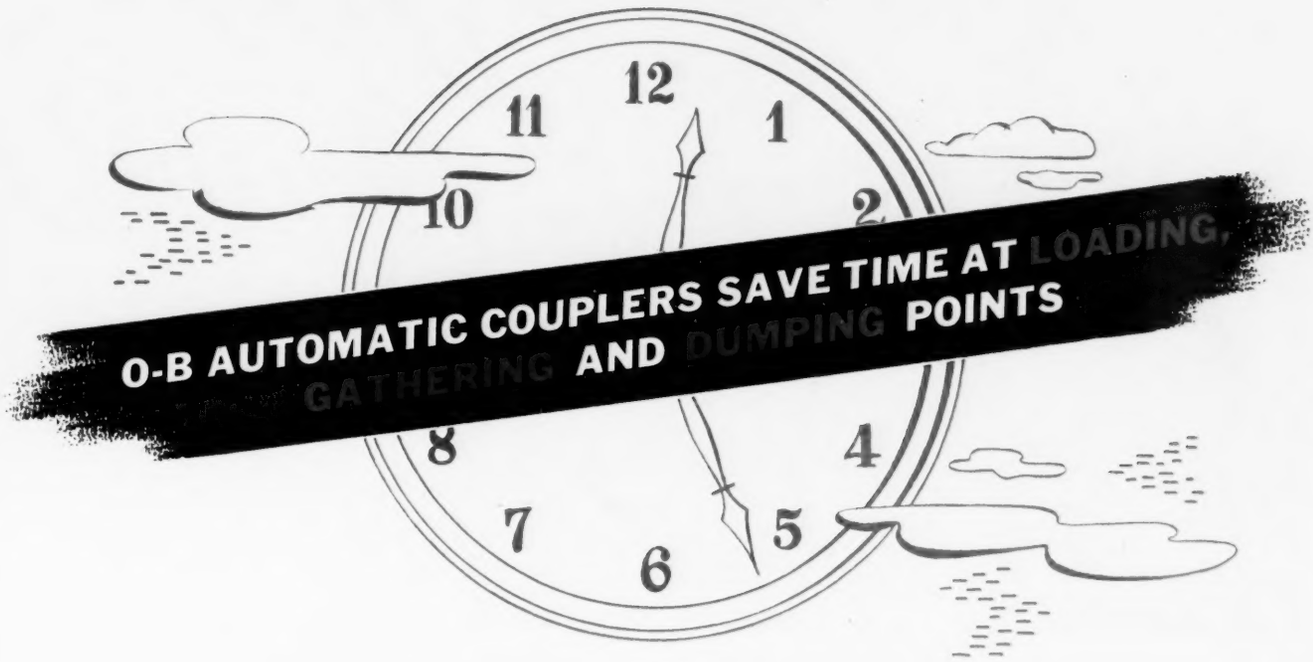


GATHERING—The motor moves in, automatically couples to a string of loaded cars and whisks them out to the main haul. Cars couple automatically as they come together—no need to go between the cars to manipulate the hitchings.



DUMPING—As the loaded car enters the hoist, it bumps off the empty which then couples into a trip without manual attention.

...SPEEDS COAL HANDLING WITH MODERN RAIL HAULAGE



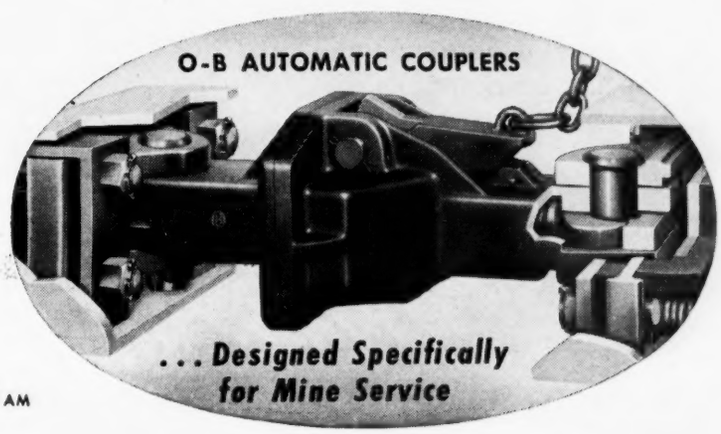
To bring coal from the vast interiors of its Leisenring Mines, the H. C. Frick Coke Company, subsidiary of the United States Steel Corporation, uses modern rail haulage, a system embracing miles upon miles of underground track and more than 1800 all-steel, end-dump cars. To add still greater efficiency to this system, each of the 1800 cars is equipped with O-B Automatic Couplers for faster car shunting, easier handling and increased personal safety.

Automatic Couplers can bring the same benefits to your haulage system. If you are contemplating the purchase of new mine cars, make it a point to investigate the O-B Automatic Coupler—the coupler designed specifically to meet mine operating conditions. Write today for engineering details.

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., LTD.,
NIAGARA FALLS, ONT.



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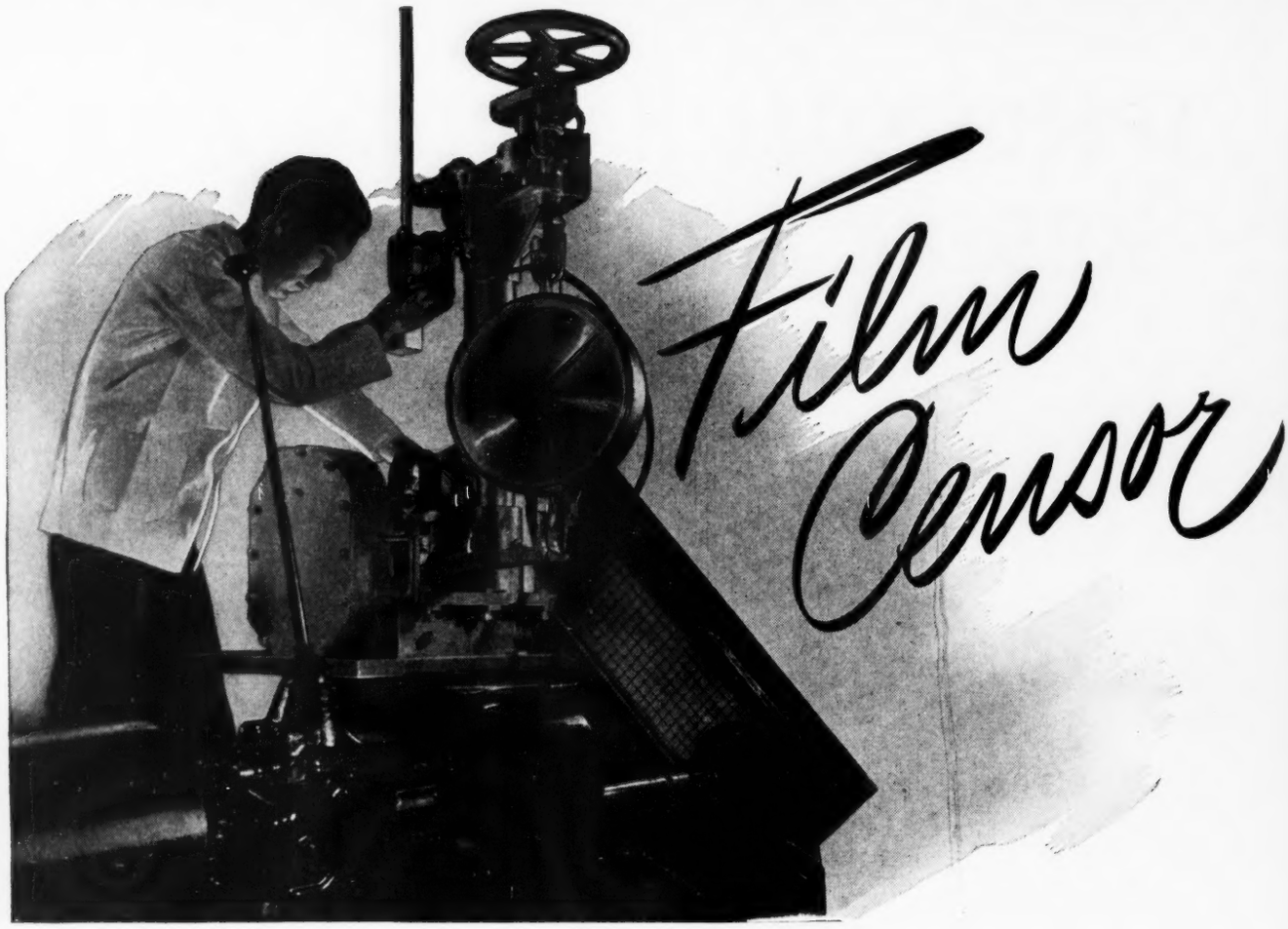


The alert technician in the illustration is censoring film—the strength of film in Sinclair industrial lubricants designed for protection of your valuable machinery.

These tests prove that Sinclair lubricants have the film strength to keep moving metal parts separated under extreme temperature and pressure conditions. With the SAE film strength test machine, skilled laboratory technicians check constantly, reject sub-standard product, assure you of essential protection.

Every batch of lubricant in process gets an equally careful check for other all-important qualities. Constant research by Sinclair assures you of the benefits of new developments in film strength...and in all other prime lubricant qualities.

Sinclair Automotive Lubricants for Strip Mining

For Engines:
OPALINE MOTOR OIL
OPALINE TBT MOTOR OIL
(For severe service)
TENOL (Heavy Duty — For Diesels)
For Gears:
OPALINE GEAR LUBRICANTS
For Chassis:
OPALINE CHASSIS LUBRICANT
For Wheel Bearings:
SINCOLUBE

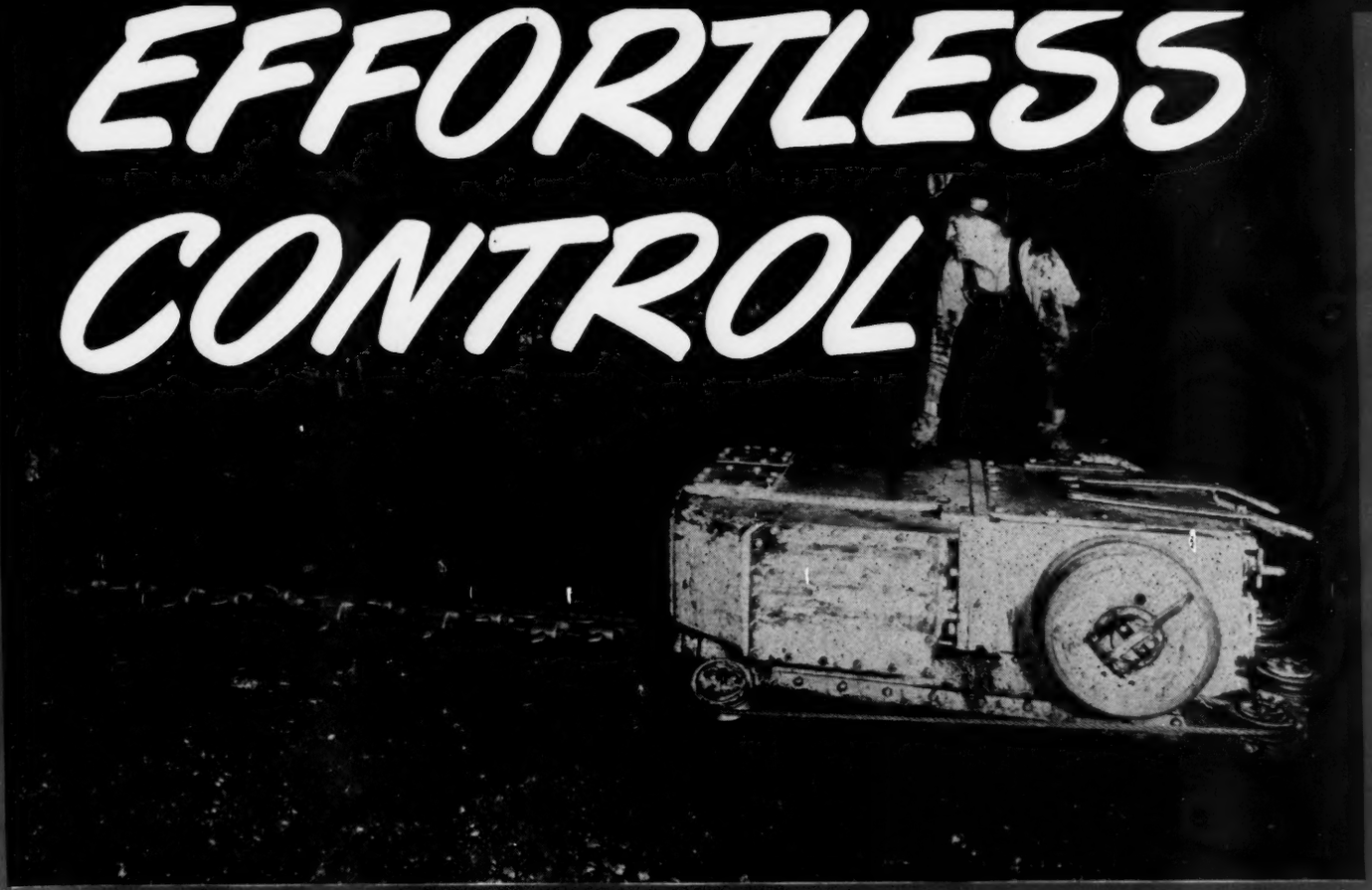
SINCLAIR REFINING COMPANY • 630 FIFTH AVENUE, NEW YORK 20, N. Y.

SINCLAIR

Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

EFFORTLESS CONTROL



FOR HEAVY DUTY WORK

SULLIVAN 7-B
Shortwall Cutter
discharges cuttings to rear

Short overall length for close timbering . . . tapered front for full sump cut and straight rib . . . variable feed control . . . drum reversing friction controls . . . drop-out type cutter chain clutch . . . complete splash lubrication . . . anti-friction bearings at all load bearing points . . . slow speed, heavy duty 50HP motor.

Consult a Joy Engineer

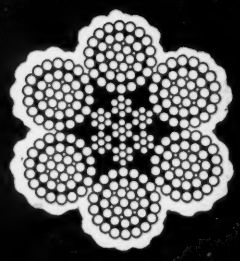
W&D CL 96

SULLIVAN DIVISION

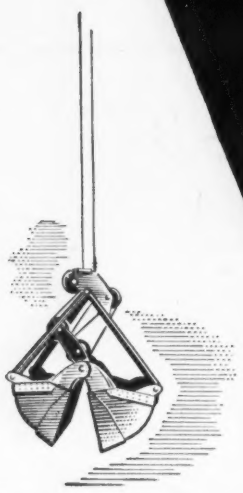
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH, PA.

For Strength plus Flexibility



UPSON-WALTON
6x37 LAYRITE WIRE ROPE



FOR overhead traveling cranes in steel mills, for winch lines and slings, for holding and closing lines on grab buckets, for towing hawsers and mining machine ropes—industry after industry has conditions where high strength must be combined with great flexibility.

Wherever drum or sheave diameters are small, or where reverse or acute bends are encountered, fatigue stresses are high. For this type of service Upson-Walton 6 x 37 Perfection Layrite Cable is best because the individual wires in the strand are finer; therefore they are more flexible and better able to resist fatigue stresses. In addition, the greater number of fine wires in the rope gives it a greater metallic area, so strength is still high.

Hemp center or, where crushing conditions are extremely severe, IWRC (independent wire rope center).

Specify Upson-Walton 6 x 37 when you need maximum flexibility plus a high degree of strength.

Specify Perfection grade because this improved plow steel is the strongest and toughest and most resistant to wear of all the grades of wire used to make rope.

Specify Layrite because this fine *pre*formed wire rope results in longer life, greater safety and greater economy.

Upson-Walton 6 x 37 Perfection Layrite is worth specifying, and always up to specifications!

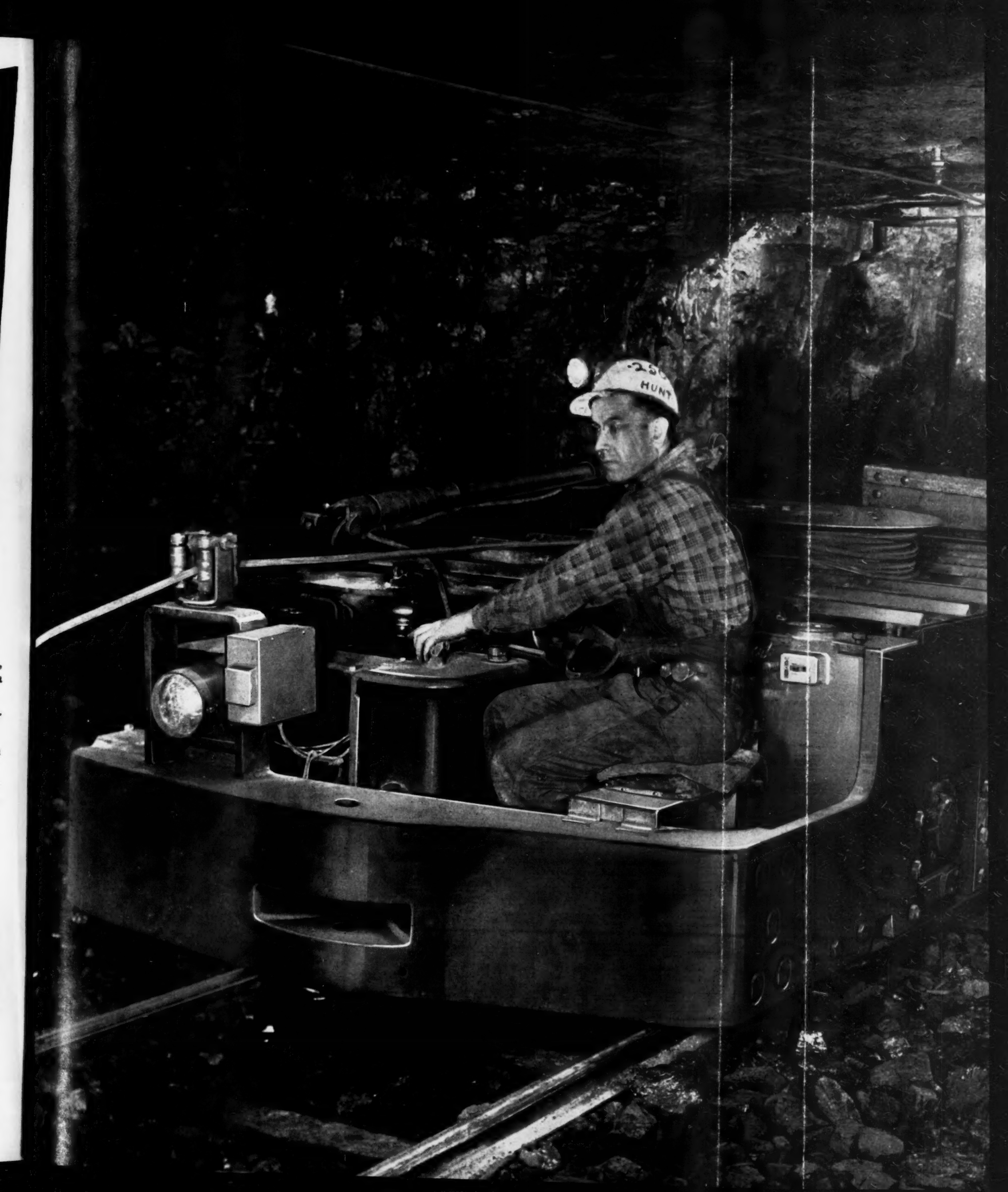
Established 1871

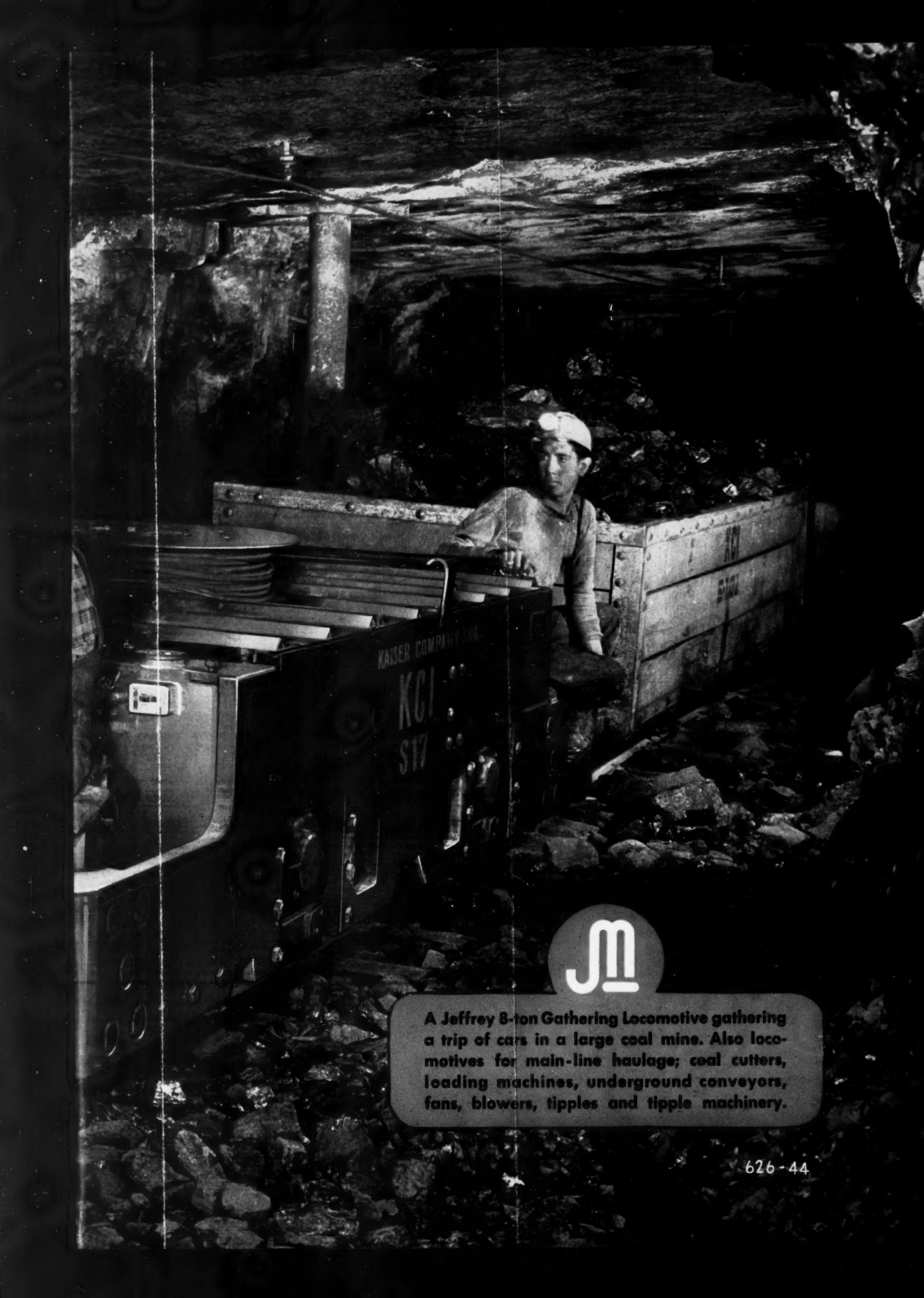
THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4 — 737 W. Van Buren Street, Chicago 7 — 241 Oliver Building, Pittsburgh 22


HUNT



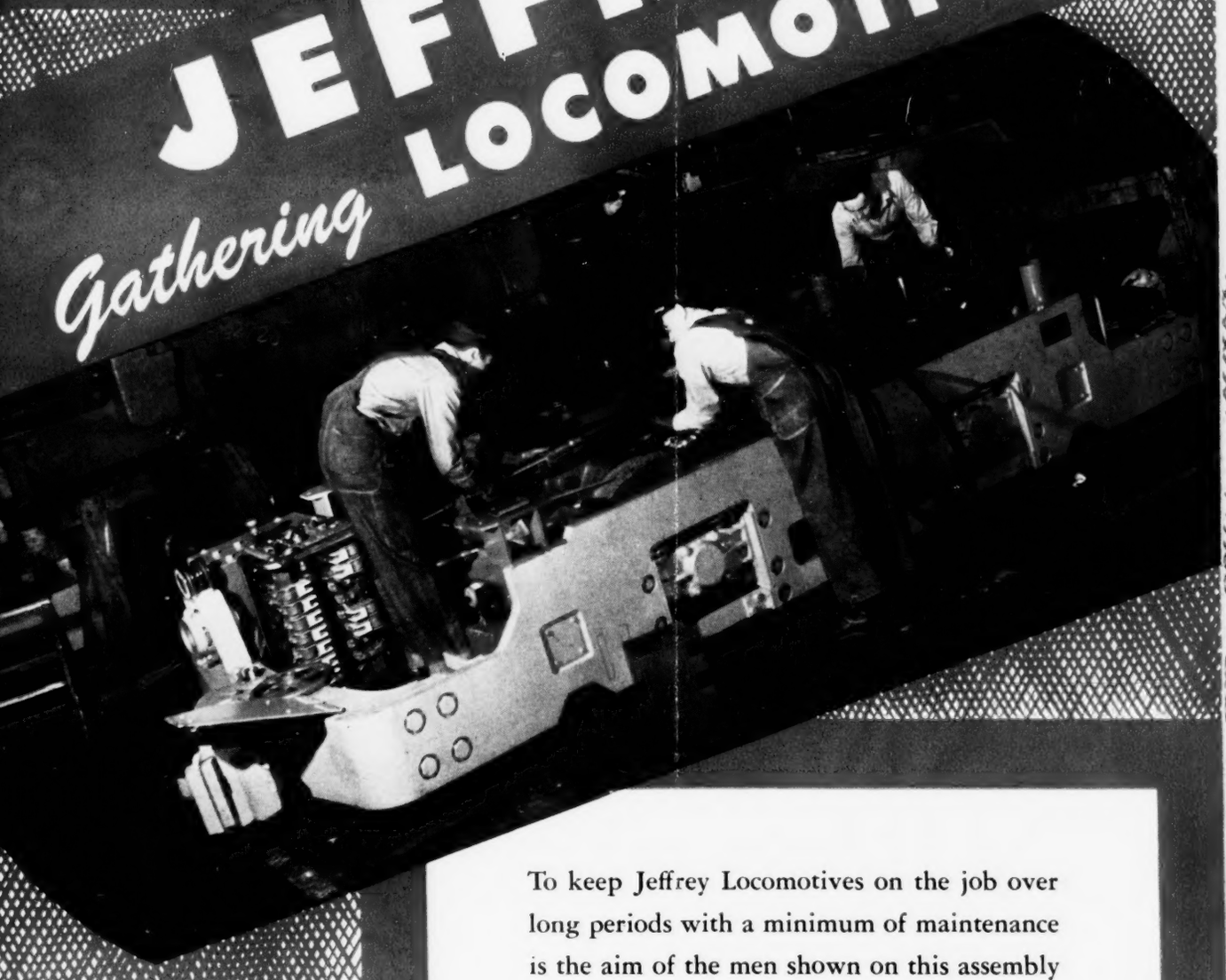
A Jeffrey 8-ton Gathering Locomotive gathering a trip of cars in a large coal mine. Also locomotives for main-line haulage; coal cutters, loading machines, underground conveyors, fans, blowers, tipples and tipple machinery.

626-44

They must be sound for operation underground

JEFFREY

Gathering LOCOMOTIVES



To keep Jeffrey Locomotives on the job over long periods with a minimum of maintenance is the aim of the men shown on this assembly line. To perform better, they must be built better. This requires more than mechanical skill and careful workmanship. It requires years of experience in building equipment to Jeffrey standards of design and construction.

That these men are doing their job well is evidenced in the service records of Jeffrey Locomotives which have been operating for years and still "going strong" under widely varying conditions. We are justly proud of these men and the products they build for Jeffrey.

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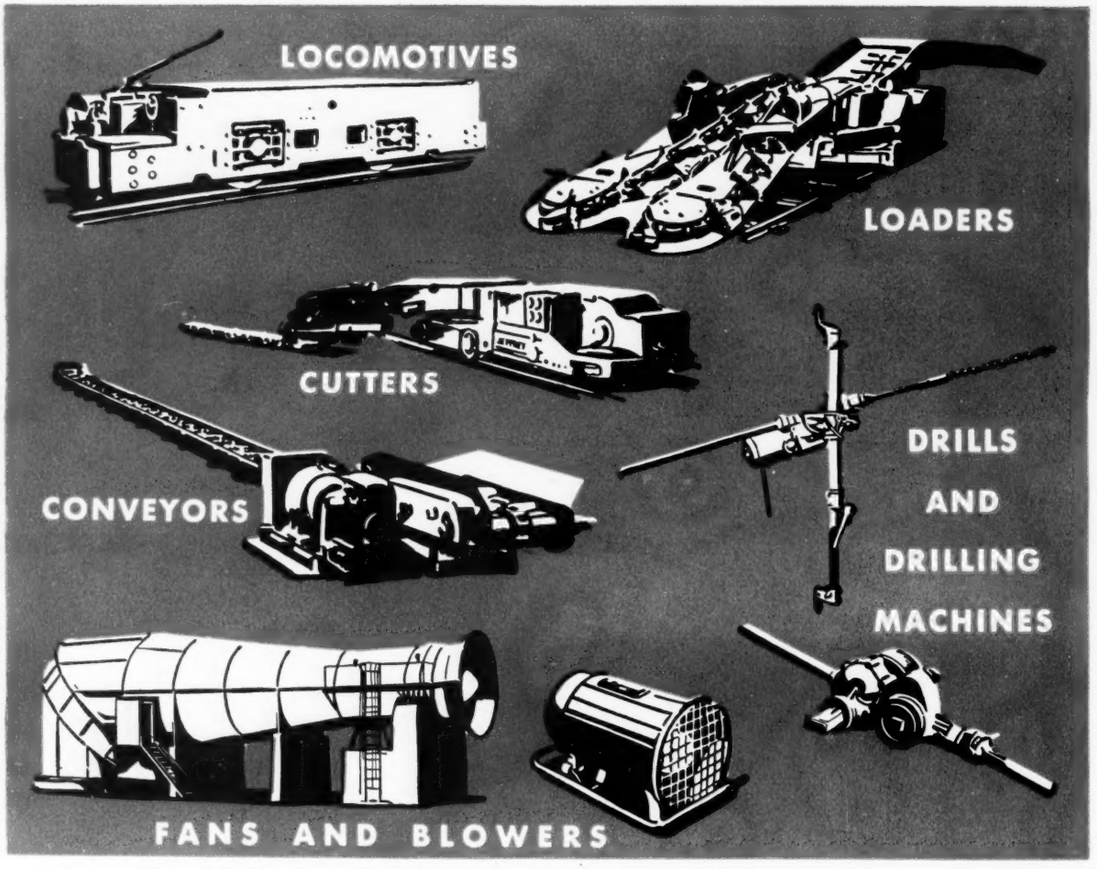
Jeffrey

EQUIPMENT FOR COAL MINES

JEFFREY SERVICE TO THE COAL MINES MEANS SERVICE TO ALL INDUSTRY



THE JEFFREY MANUFACTURING COMPANY

Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.

This truck has made 400,000 miles without engine trouble...with Stanolube HD

The William Klipsches, Sr. and Jr., of the William Klipsch & Son Coal Company, St. Louis, Missouri, talk over the splendid performance of their 25-ton hopper-type truck.

This 25-ton, hopper bottom coal truck is one of 19 trucks in the Klipsch and Sons Coal Company fleet hauling coal from the mines.

When this truck was put into service, Mr. Klipsch decided to try a heavy duty, detergent-type motor oil. He felt that such an oil would help cut maintenance on his older trucks and ward off trouble in the new and vitally important 25-ton unit. He picked Stanolube HD.

Results have been excellent. In the older trucks, distance between overhauls has been increased to 150,000 miles. Engines show complete lack of sludge and almost no varnish. And the special hopper truck has lost no time due to faulty engine performance in well over 400,000 miles of steady daily driving.

You can find out for yourself how Stanolube cuts maintenance costs and delays, just by asking a Standard Oil Engineer to test it in one of your hard-working mine trucks.

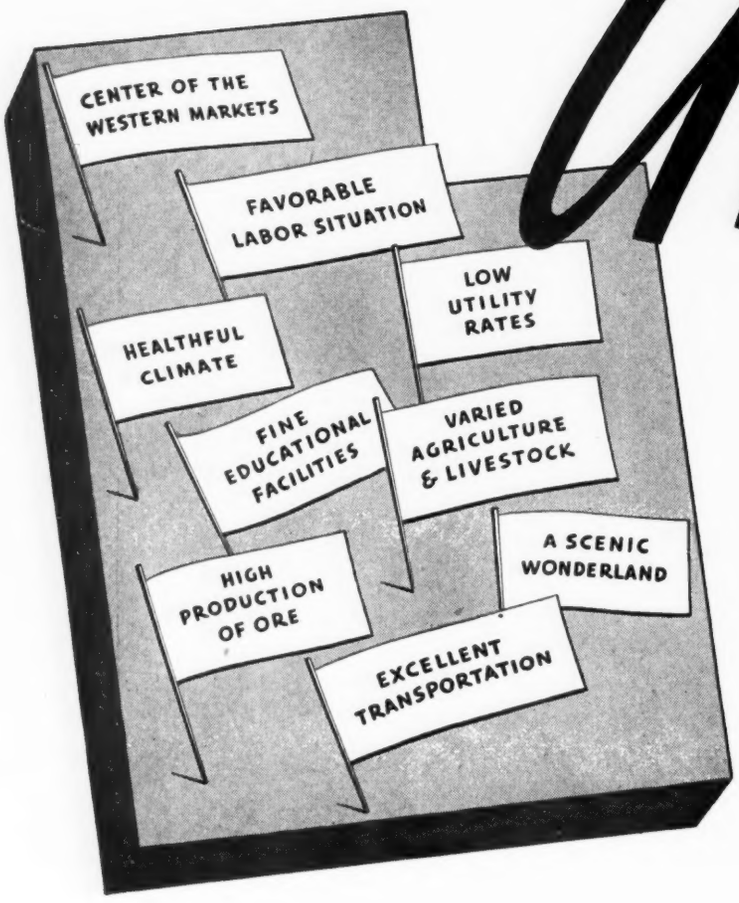
Just write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Utah *



Herbert B. Maw, Governor of Utah, tells his state's story.

"Nature was kind to Utah. Deposited within her borders are rich and varied sources of coal and iron, lead and zinc, copper, silver and gold. These and many other industrial attributes are part and parcel of the undeveloped sections of this state.

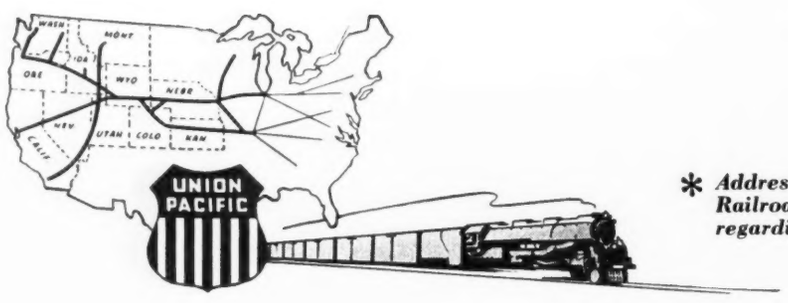
"A gigantic steel industry which can serve the west signals our industrial ambition. It will form the nucleus of a network of associated industries.

"Our need now is people and leadership to share in the prosperity of a western empire. Our natural resources are practically untouched. They assure a long life to an industrial future which is just now beginning. Utah invites new and expanding industry to investigate opportunities here before deciding upon new locations."

★ ★ ★

For industrial resources and opportunities, look to Utah. For unexcelled rail transportation . . .

* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*



be Specific – say "Union Pacific"

* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

NEW CARDOX Mine-Fire CAR

ENGINEERED TO PROVIDE MAJOR PROTECTION AGAINST

DEEP-SEATED COAL FIRES

OIL FIRES

ELECTRICAL FIRES

The Cardox Mine-Fire Car combines in a single mobile unit facilities for (1) driving out smoke and reducing the temperature in a room or passageway, (2) sealing the surface around deep-seated coal fires with "CARDOX FIRE COAT," (3) quickly extinguishing oil and electrical fires, with absolutely no damage by the extinguishing medium to the equipment involved, (4) "CARDOX FIRE COAT" provides a quick, effective method for creating temporary, rigid fireproof seals in burning areas, (5) provides CO_2 for inerting the atmosphere to prevent an explosive concentration of methane gas.

Full details on the size, design and fire-fighting efficiency of this specialized Cardox Mine-Fire Car are available in a bulletin just off the press. Write for your copy today.

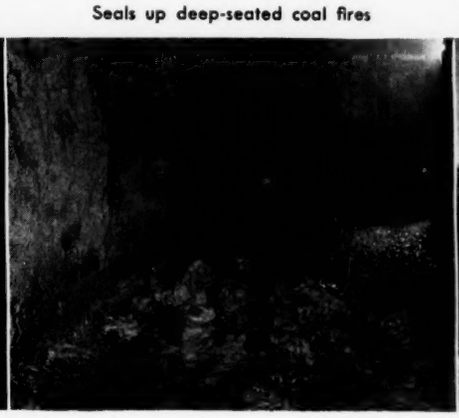
CARDOX CORPORATION

BELL BUILDING • CHICAGO 1, ILLINOIS

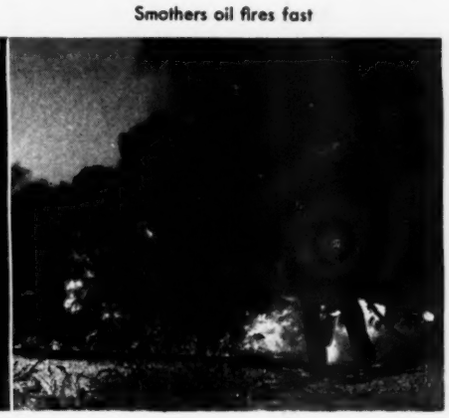
District Offices: New York . Philadelphia . Library, Pa. . Pittsburgh . Meadowview, Va. . Harper, W. Va. Camden-on-Gauley, W. Va. . Cleveland . Detroit . Evansville, Ind. . Benton, Ill. . St. Louis Louisville, Col. . San Francisco . Los Angeles . San Diego

Drives out smoke

Seals up deep-seated coal fires

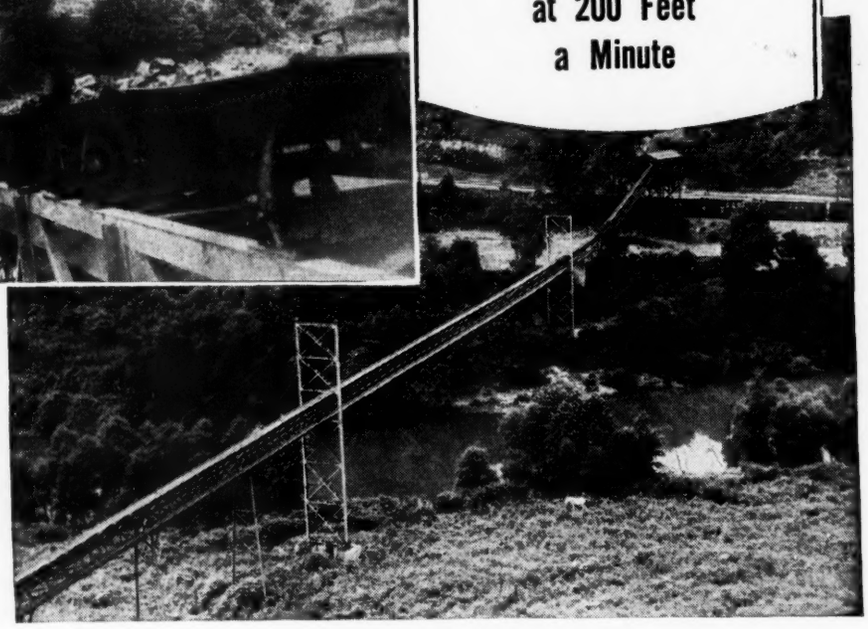


Smothers oil fires fast



Kentucky to West Virginia on a Continental Conveyor

200 Tons an Hour of Run-of-mine Coal Carried 680 Feet at 200 Feet a Minute



Continental Idlers

A complete line of Troughing, Flat Belt and Picking Table Idlers, Timken or SKF equipped, for belts 14 to 60 inches wide. Also a complete line of accessories, including Trippers, Pulleys, Take-ups, Drives, etc.

Write for Bulletin ID-105

When the Belfry Coal Company opened a new mine in Kentucky, they were faced with the problem of hauling the coal across the Tug River to the C & O Railroad in West Virginia. Many methods were considered, but it soon became apparent to company engineers that a belt conveyor carried on a suspension bridge was the most practical solution.

Continental engineers then designed the system pictured above on which run-of-mine coal is uniformly fed by an apron feeder onto the 36" belt conveyor—sped across the river at 200-FPM to the tipple on the opposite embankment.

This is typical of the manner in which Continental engineering is assisting industry in solving their materials handling problems.

Many industries are taking advantage of our present day stocks to build complete conveyors. Send us your orders or inquiries.

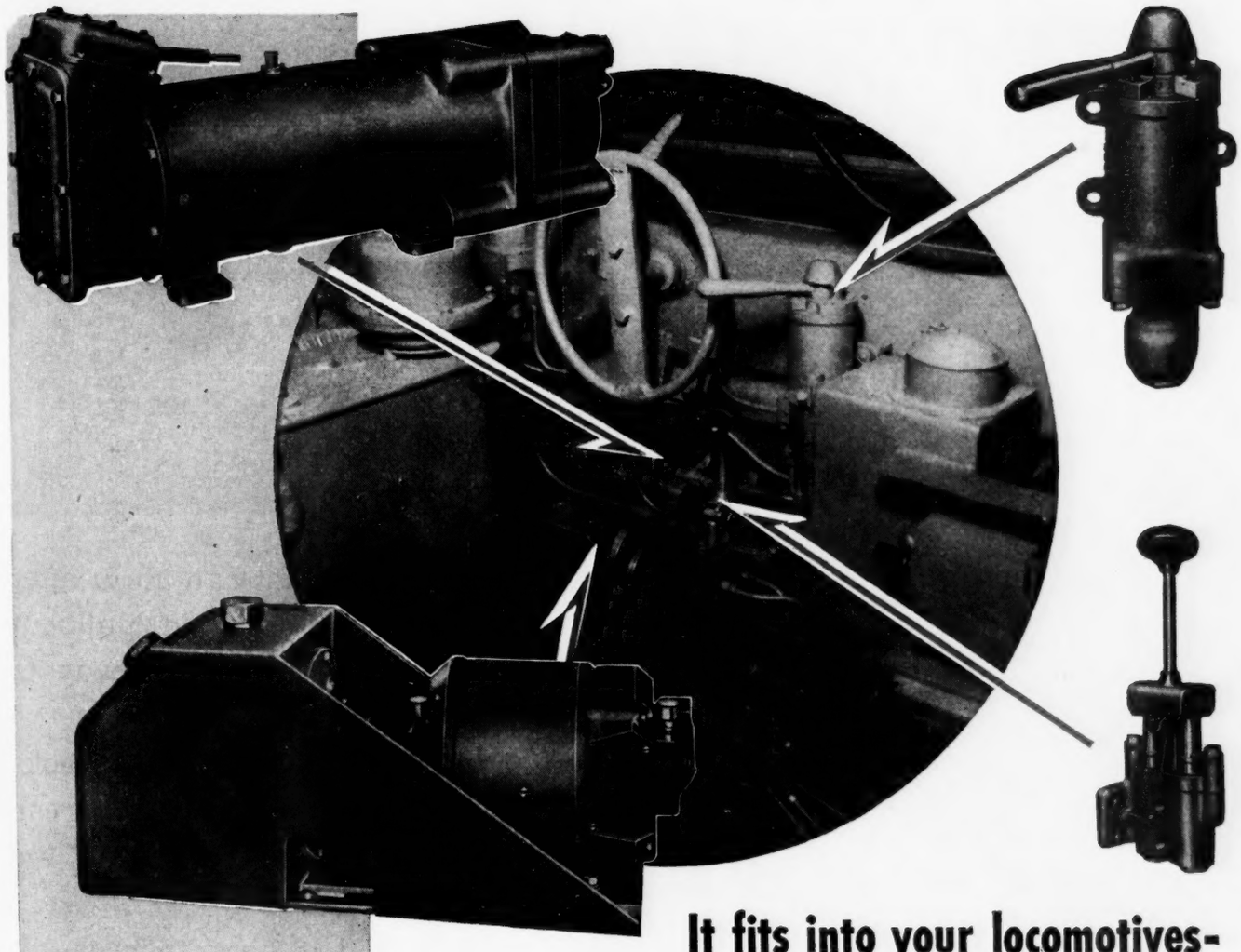
100A

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • MEMPHIS



It fits into your locomotives-

and into your haulage plans

WESTINGHOUSE HYDRAULIC BRAKES

Here's the modern, *power* braking you need on your modern, high-speed locomotives . . . put up in a small package.

The engineers focused on compactness in the design. As a result, this brake system provides the instant response, flexibility of operation, and high braking forces essential for safe, speedy haulage . . . yet can be tucked away into unused corners and crannies of the locomotive.

The faster, better control permits higher top speeds, and improves average speeds through faster brake application and release. Car spotting can be handled with greater ease and accuracy. Overall haulage efficiency takes a definite upward step, and maintenance from worn wheels, split pinions, and motor damage due to bucking takes a definite drop, when Westinghouse Hydraulic Brakes are installed.

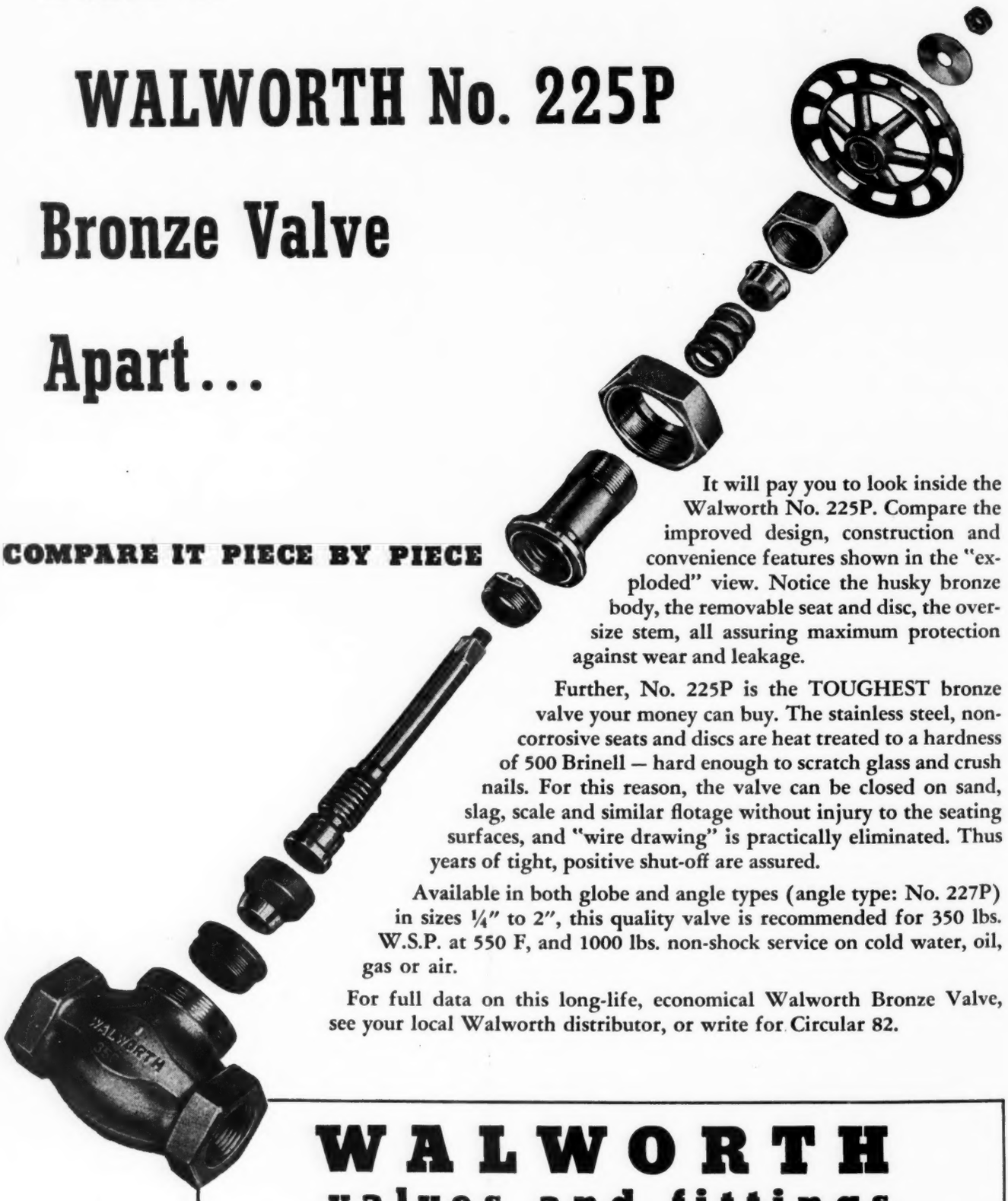
Ask for bulletin SP 9092 for details. You can install these brakes the next time your locomotives are in the shop.

Westinghouse Air Brake Co.

INDUSTRIAL DIVISION

WILMERDING PENNSYLVANIA

Take a WALWORTH No. 225P Bronze Valve Apart...



COMPARE IT PIECE BY PIECE

It will pay you to look inside the Walworth No. 225P. Compare the improved design, construction and convenience features shown in the "exploded" view. Notice the husky bronze body, the removable seat and disc, the oversize stem, all assuring maximum protection against wear and leakage.

Further, No. 225P is the TOUGHEST bronze valve your money can buy. The stainless steel, noncorrosive seats and discs are heat treated to a hardness of 500 Brinell — hard enough to scratch glass and crush nails. For this reason, the valve can be closed on sand, slag, scale and similar flotage without injury to the seating surfaces, and "wire drawing" is practically eliminated. Thus years of tight, positive shut-off are assured.

Available in both globe and angle types (angle type: No. 227P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular 82.

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

A Kennametal *bit that cut*

175

places before it was sharpened

1000

places before wearing out

These are figures taken from performance data collected by a satisfied user of Kennametal cutting machine bits in a Washington County, Pennsylvania coal mine. Comparing Kennametal bits with steel bits cutting coal in the Pittsburgh seam, mine operators found that steel bits cut 4 places before sharpening; Kennametal, 175. A margin of 171 places with Kennametal under conditions that were identical. A thousand places were cut before the bits wore out, about 16,000 tons of coal mined. And the bit cost figured only .4 of one cent per ton.

This mine used the new bits on a Jeffrey 35BB cutting machine having a 9′ bar, and 9′ by 12′ places were cut at the rate of 13 minutes per place. When steel was used it took 18 minutes per place, and the cutting machine consumed 25 to 33% more power. Moreover, enough time was saved in an eight-hour shift to pay for all the 42 Kennametal bits in the cutter bar chain. Such facts as these help to explain why more and more coal mines use Kennametal bits every day. And why they may be able to help you bring about more economical coal cutting.

If you would like a demonstration, our representative in your district will be glad to contact you. Simply write—Mining Division, Kennametal Inc., Latrobe, Pa., giving your name and address. As prompt delivery can be made, we suggest you write today!

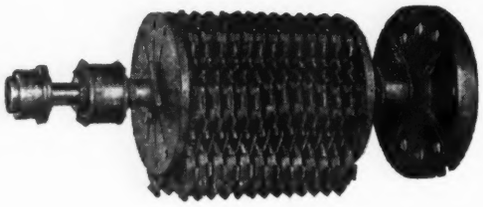
KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL *Inc.*, LATROBE, PA.

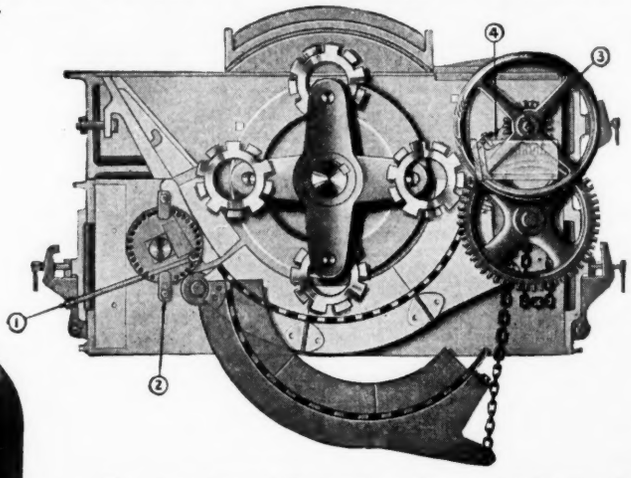
the Rings are the reason for Minimum Fines Uniform Sizing— and only

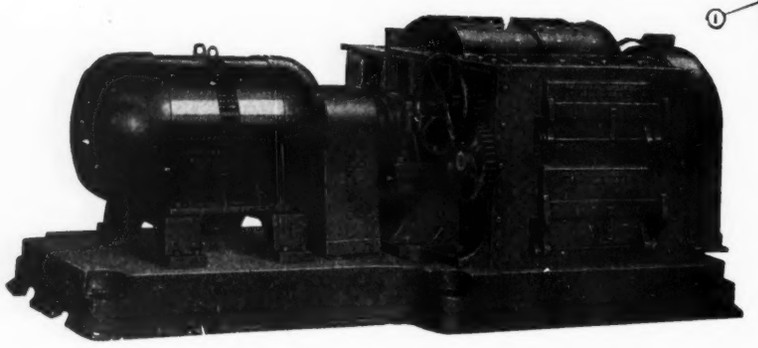
AMERICANS have SHREDDER RINGS



Americans exclusive manganese steel shredder rings that reduce by rapid splitting impact are the reason Americans produce minimum fines, uniform sizing and no oversize. Each shredder ring has 20 cutting edges, revolves freely on its own shaft and deflects without damage from tramp iron. The high tonnage output of Americans at slow power-saving speeds is attained by the rapid reducing action of the multiple cutting edges of the rows of rings on the rotor, as shown at left.

Cross section view at right shows double adjustment features. (1) Set bolt releases (2) Eccentric for grinder plate adjustment (3) Handwheel raises or lowers cage, locked in position with (4) Position lock pawl. Moving grinding plate closer to rings or raising cage makes product finer. Moving grinding plate away or lowering cage will make it coarser.





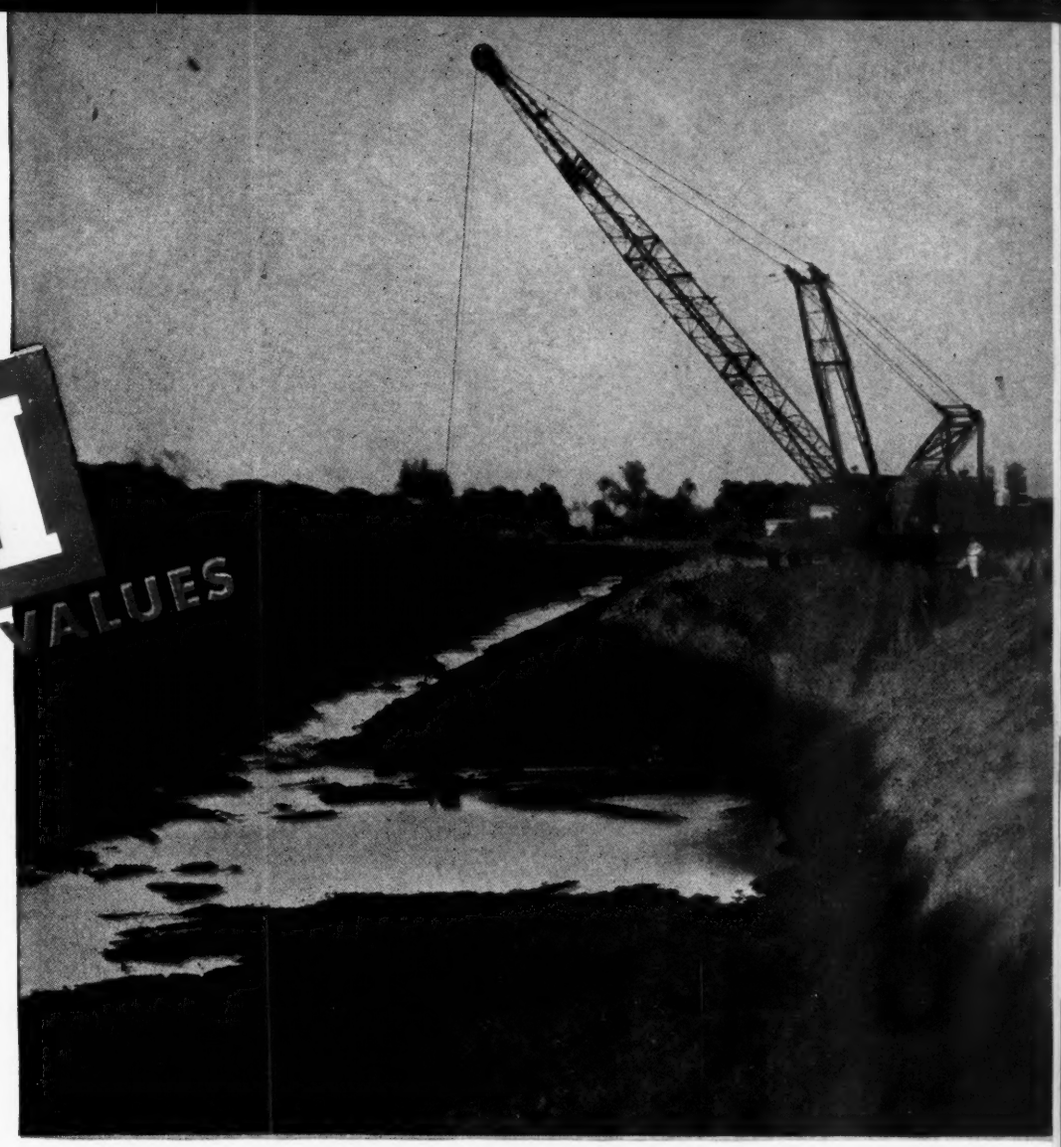
The American AC Crusher shown at left direct-connected to motor is designed and built for long dependable service. The entire frame is of sectional design with easy access to crushing chamber lined with standard manganese steel sections.

Send for latest "AC" Bulletin.

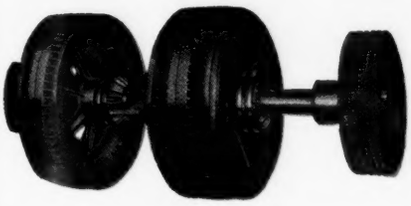
American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Avenue
St. Louis 10, Mo.



"Slickest Swing we ever knew!"



THE P&H MAGNETORQUE SWING

Electromagnetic forces transmit power for both swing and propel . . . magnetic pull instead of mechanical friction. Electric current is supplied by a small generator on the main engine — controlled from operator's station. Swinging slow or fast, has cushioned acceleration and deceleration. Swing friction maintenance is eliminated. It's another important P&H Added Value.

You'll hear owners say it again and again — wherever you find the P&H Model 1055 on the job. And you'll find them all over the country.

It's not surprising that the P&H Magnetorque Swing should be such an outstanding success. For swing clutches have always been a major source of trouble.

ELIMINATES SWING FRICTIONS

P&H removed the cause of trouble by replacing the swing frictions with Magnetorque units, mounted in the same relative position. They transmit power for swing motions without mechanical linkage, without friction — without wear.

SPEEDS PRODUCTION

Swing is smoother, faster, more responsive. Quicker, more accurate starts and stops eliminate waste operating time—increase daily production — cut yardage costs.

NO MORE MAINTENANCE

You need never lose another day — or even an hour — because of swing clutch maintenance, repair or replacement. The P&H Magnetorque unit will last the life of the machine.

Users will tell you it's one of the most important improvements ever made in the field of large excavators. That's why users won't be without it . . . why they reorder. Ask for complete information.

P&H EXCAVATORS
4540 W. National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

Sharpens Quickly

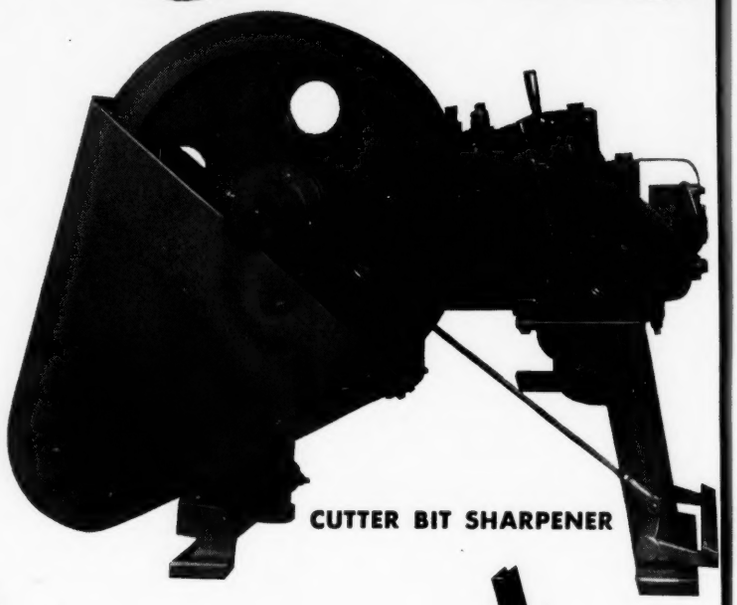
...up to 3,000 bits per shift

SULLIVAN

CUTTER BIT SHARPENER

Saves time . . . lowers costs
provides better, uniform bits

Uniform bits, properly shaped, turned out at a fast rate by the Sullivan Cutter Bit Sharpener will increase cutting machine efficiency and lower operating costs. Unit furnished with gear type motor or with pulley for belt drive.



CUTTER BIT SHARPENER

AUTOMATIC CUTTER BIT HEATER
time-saving companion to bit sharpener

Correct heating before sharpening is important to uniform quality cutter bits. Only point is heated in the Sullivan Heater, consequently shank is not tempered. Gravity feed that automatically heats bits to proper temperature.

Consult a Joy Engineer

W&D CL

SULLIVAN DIVISION

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH, PA

EXPERIENCE

Produces Successful Designs

A.C.F.'s many years' experience in producing mine cars of all types to serve the needs of the coal industry makes it possible for us to furnish the most modern, efficient cars for your mine.

Regardless of your needs—whether end dump type, rotary dump type, or automatic drop-bottom type—for thick or thin seams—A.C.F. can meet your requirements!

Many outstanding A.C.F. features are provided, such as, double-action, heavy-duty, spring bumpers—electrically welded steel end sill members—"Lubricated" doors for drop-bottom cars and other refinements

Why not discuss your car design problems with our sales representatives—Today! They are anxious to serve you.

American Car and Foundry Co.

NEW YORK • CHICAGO • ST. LOUIS • CLEVELAND
WASHINGTON • PHILADELPHIA • SAN FRANCISCO
PITTSBURGH • HUNTINGTON, W. VA • BERWICK, PA.

MINE CARS

You Can SEE That

It's ONLY the SIDE of a V-Belt

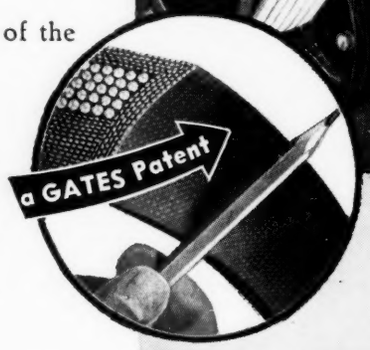
That Grips the Pulley and *Gets the Wear!*

DIAGRAM OF BELT IN PULLEY GROOVE

Look at a V-Belt in its sheave and you see at once that the *sides* of the belt do all the gripping on the pulley and get all the wear against the sheave-groove wall.

Notice, too—it's the *sides* that pick up all the power delivered by the driver pulley. The sides *transmit* that power to the *belt as a whole*. And then, once more, it's the sides—and the sides *alone*—that grip the driven pulley and *deliver* the power to it.

That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.



—*and Here Is How the*

CONCAVE SIDE

★REDUCES Sidewall WEAR

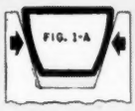
and Lengthens Belt Life!

Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley



You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

★More Important NOW That STRONGER Tension Members are Used

Now that Gates *Specialized* Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

THE GATES RUBBER COMPANY Denver, U. S. A.

"World's Largest Maker of V-Belts"

473

GATES VULCO ROPE DRIVES

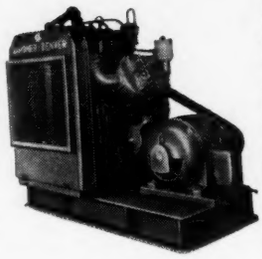
Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

Gates

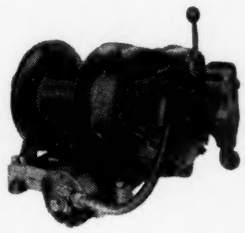
REG. U. S. PAT. OFF.

THE MARK OF SPECIALIZED RESEARCH

BUILT FOR MORE TONNAGE



No outside piping needed with this Gardner-Denver "WB" Vertical Water-Cooled Compressor. Its combination radiator and air-cooled intercooler gives it the edge where cooling water is scarce. Remarkably compact, these compressors are available in capacities from 142 to 445 cubic feet per minute.

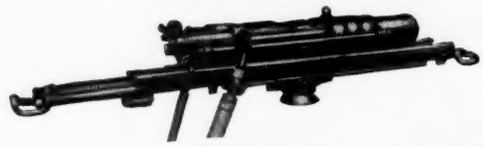


Should the supply of air to this Gardner-Denver HKK Safety Hoist fail for any reason, an automatic brake is instantly applied! That's why this hoist is so popular where safety for load and for operator is final consideration.

More footage per shift—with less operator fatigue! That's what you get in this Gardner-Denver S33 Drill, weighing only 31 pounds and remarkably easy to handle. Four-pawl rotation gives it extra power.

Users call this drill the most effective 55-pound sinker! Built for heavy duty operation, it is remarkably easy riding. Fast and powerful, it has conservative air consumption.

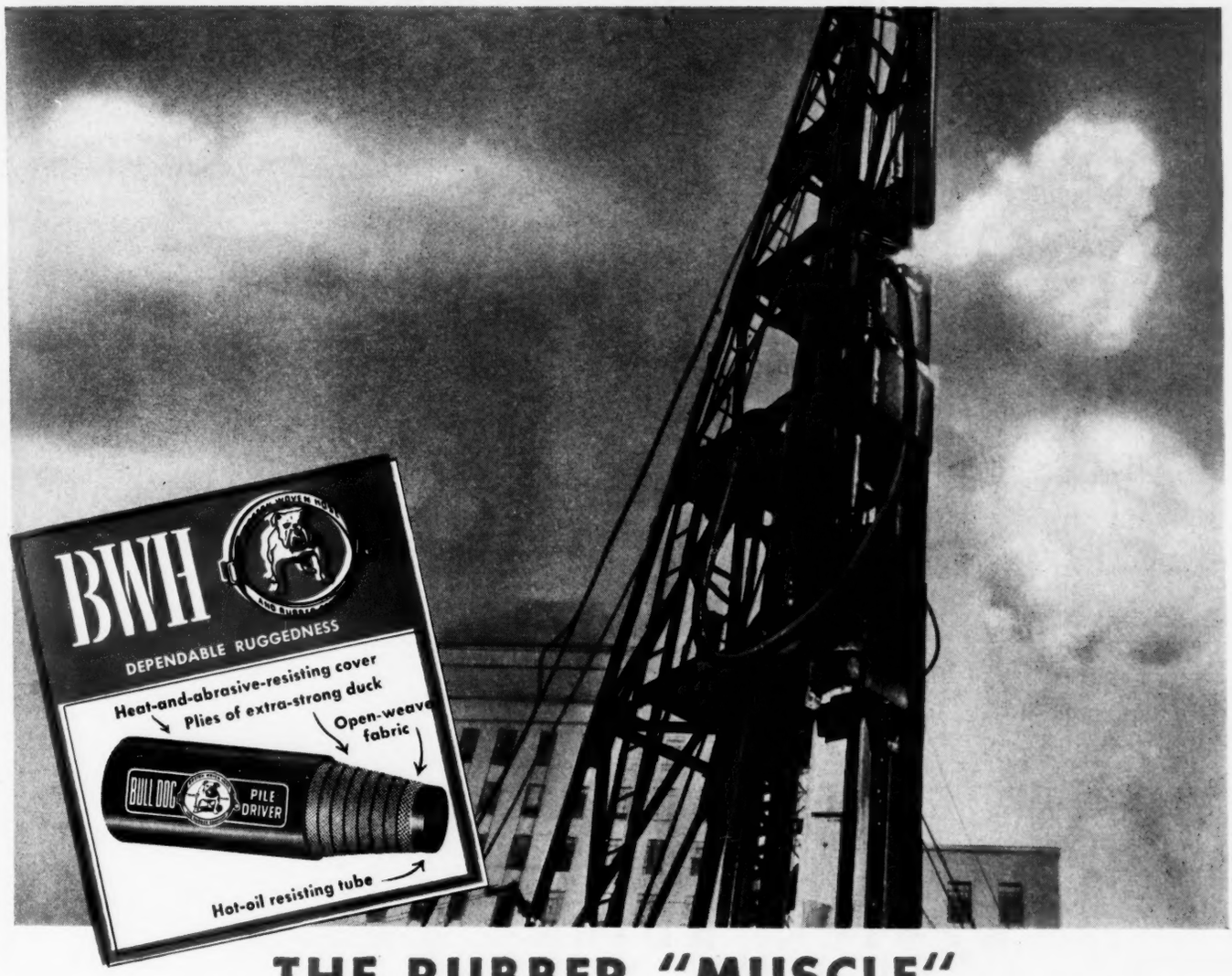
The holding handle of this Gardner-Denver R104 Stoper is located well up on the cylinder to provide better balance and greater safety in use. A self-rotating stoper, the R104 has a fully automatic system of cleaning air to keep out water and sludge.



This Gardner-Denver CF89H Drifter practically runs itself! Fully automatic in action, the drill feeds itself exactly in accordance with the character of the ground—no need for frequent manual adjustment.

For complete information, write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER SINCE 1859



THE RUBBER "MUSCLE" THAT POWERS A 2-TON HAMMER

Another problem solved by BWH

A New England contractor needed a new steam hose on his pile driver . . . a "muscle" to swing the rig's 2-ton hammer. He wanted a top-quality hose that could take the severe operating conditions . . . hammer shocks, pulsations caused by varying high pressures, and the deteriorating effect of hot oil shot through the hose to lubricate the hammer. When he called on BWH for help, our engineers recommended Bull Dog Pile Driver Hose.

This tough hose has a tube made with a special compound, highly resistant to hot oils. An open-weave fabric anchors the tube to the carcass.

The secret of the hose's strength lies in this carcass. It's made of specially-woven duck, applied at an angle to absorb pressure stresses and shock loads. And because so many plies of duck are used, this sturdy BWH hose far outwears other "under-plied" hose.

The rubber cover is also heat-resisting . . . besides offering protection from abrasion and moisture.

This hose performed perfectly on the job . . . it's still going strong.

Bull Dog Pile Driver Hose is just one of the many quality products manufactured by BWH. Whatever your need for industrial rubber goods, look to BWH for dependable ruggedness . . . BWH distributors for dependable service.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearby BWH distributor, or write to us direct.

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in All Principal Cities

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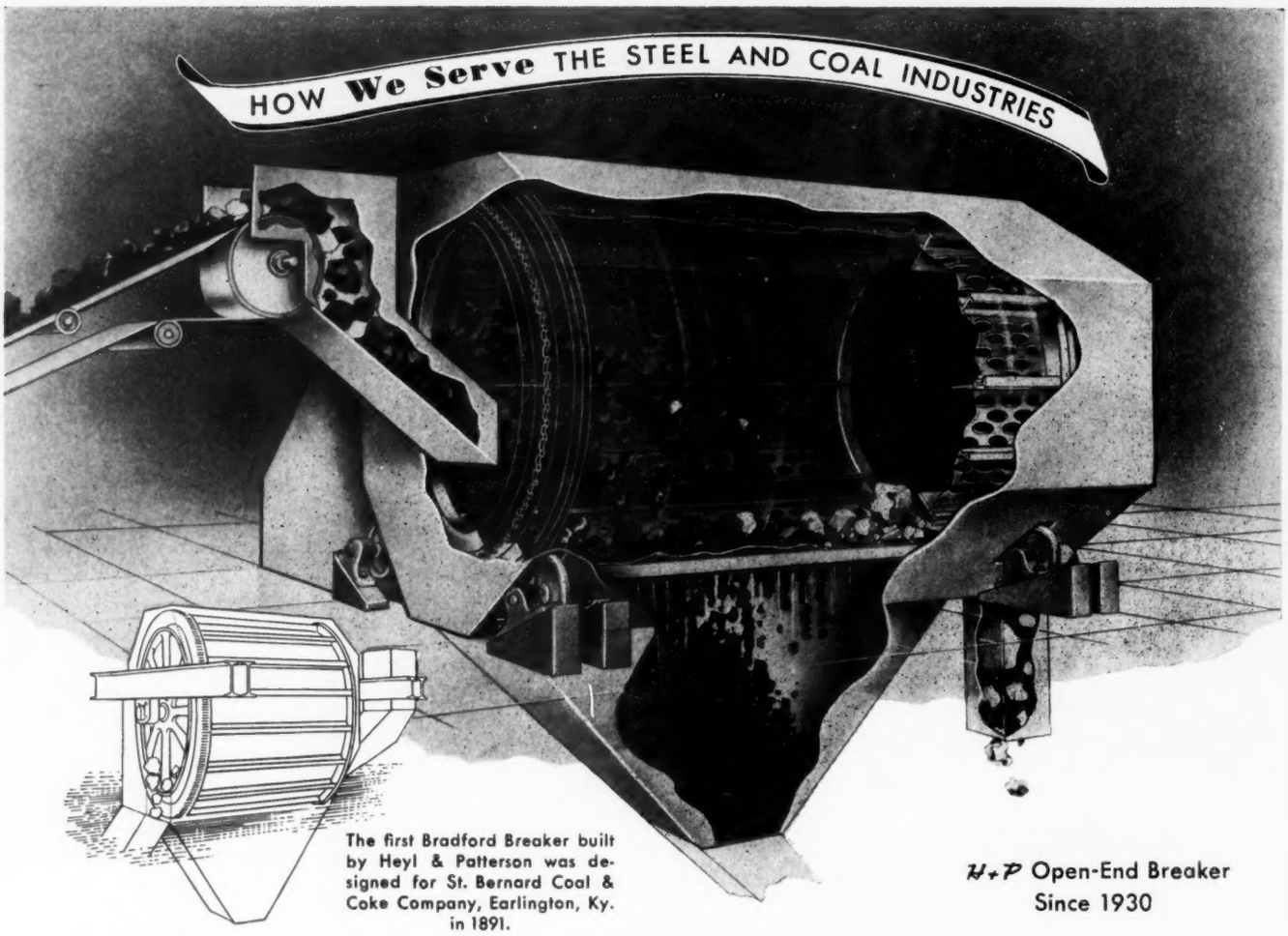

The first Bradford Breaker built by Heyl & Patterson was designed for St. Bernard Coal & Coke Company, Earlington, Ky. in 1891.

H+P Open-End Breaker Since 1930

We DESIGN, BUILD & ERECT BRADFORD BREAKERS

Through the years since 1891, H+P has continued to build the standard type of Bradford Breaker.

These Bradford Breakers remove rock and other foreign materials from the coal and also reduce the coal to the required size. It is essentially a preliminary coal cleaner. At the same time it functions as a crusher and as protection to coke plant or power plant equipment which may follow it.

In 1930 H+P built their first open-end Bradford Breaker, which permits entry of larger pieces into the breaker.

H+P open-end breakers are being used where full seam mechanized mining produces a larger percentage of refuse as well as larger pieces of rock. The Coal Preparation Plant is thus relieved of handling this foreign material. New improvements by H+P allow for screening the coal with a minimum of degradation.

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Heyl+Patterson, Inc.

"SINCE 1887"

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let *FABRI-FORGED* cutter bars and chains help you meet today's higher mining cost

Higher wages, higher freight rates, higher costs generally cut the spread between mining cost and price ceilings. The only answer is greater efficiency, economy and dependability in your mining equipment.

Here is how Bowdil Fabri-Forged Cutter Chain and Bars and Bowdil Concave Bits supply that answer . . . help you keep operating profits up.

FABRI-FORGED cutter chain saves time, cuts costs

1. **Eliminates Damaged Guides and Wearing Strips.** Bowdil's true-running radial track guide makes the chain circle the head at the correct angle. Smooth, wobble-free run prevents damage to guide or wearing strips.

2. **Extra Strength.** Drop-forged lug body and symmetrical connector are of equal strength . . . strong enough to withstand many times normal loads.

3. **Easy to Maintain.** Bowdil design makes connection, removal and replacement quick and easy. One-piece bit holder, wedging bit securely to lug projection, can be quickly inserted by anyone.

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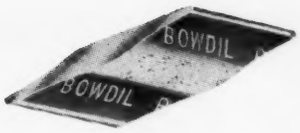
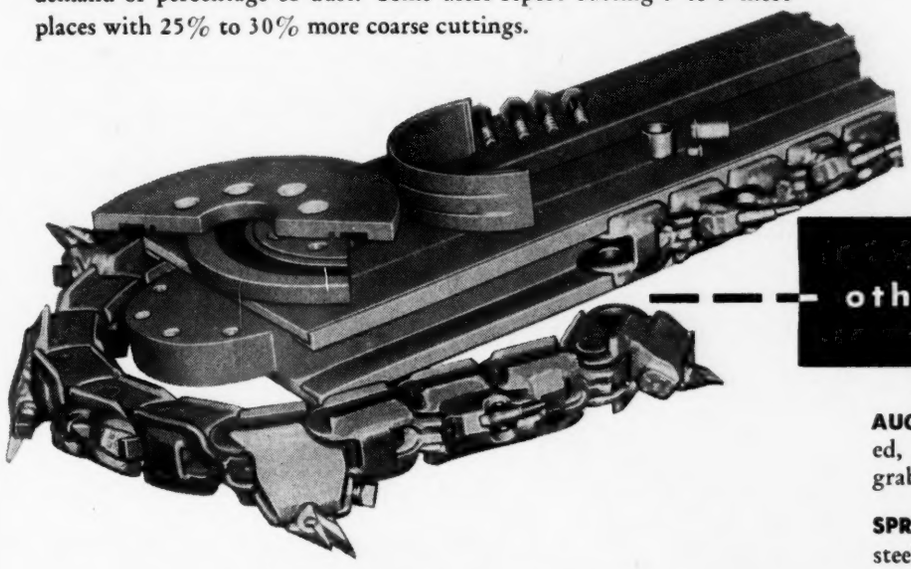
5. **Long Life.** Large pin and bushing, heat treated for maximum wearing life, take the wear. Heavy shoulders on links and lugs carry the load and shock . . . distribute stress . . . lengthen life and increase efficiency of entire cutting end of machine.

coal mining equipment...THI

Bowdil concave cutter bits give 15% to 20% longer life



Actual operating records prove Bowdil Concave Cutter Bits give 15% to 20% longer life than ordinary bits . . . plus important power savings. The concave face permits Bowdil Bits to function efficiently when worn down 25% farther than others without increasing power demand or percentage of dust. Some users report cutting 3 to 5 more places with 25% to 30% more coarse cuttings.



other BOWDIL cost cutters

AUGERS AND DRILL BITS specially heat treated, give longer service . . . eliminate grabbing.

SPROCKETS of long-wearing, tough alloy steel specially heat-treated for hard service. Sprockets in stock for all popular makes of machines.

AUGER BITS. Tough, long-wearing. Fish tail, four point and two point clay bits.

BOWDIL ROPE SOCKET. Safe, easily installed, easily removed, light, strong, protects the rope by providing a straight pull.

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TWO-POLE CABLE AND REEL SWITCH. Sturdy, dependable, durable.

FABRI-FORGED cutter bars give longer service, produce more coarse cuts, save power

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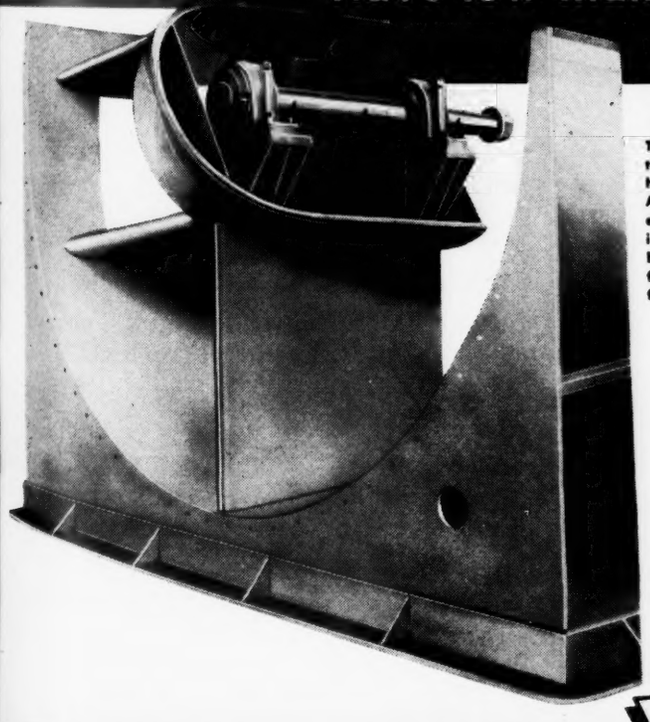

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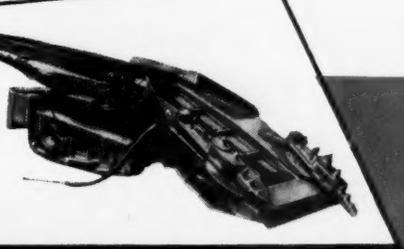

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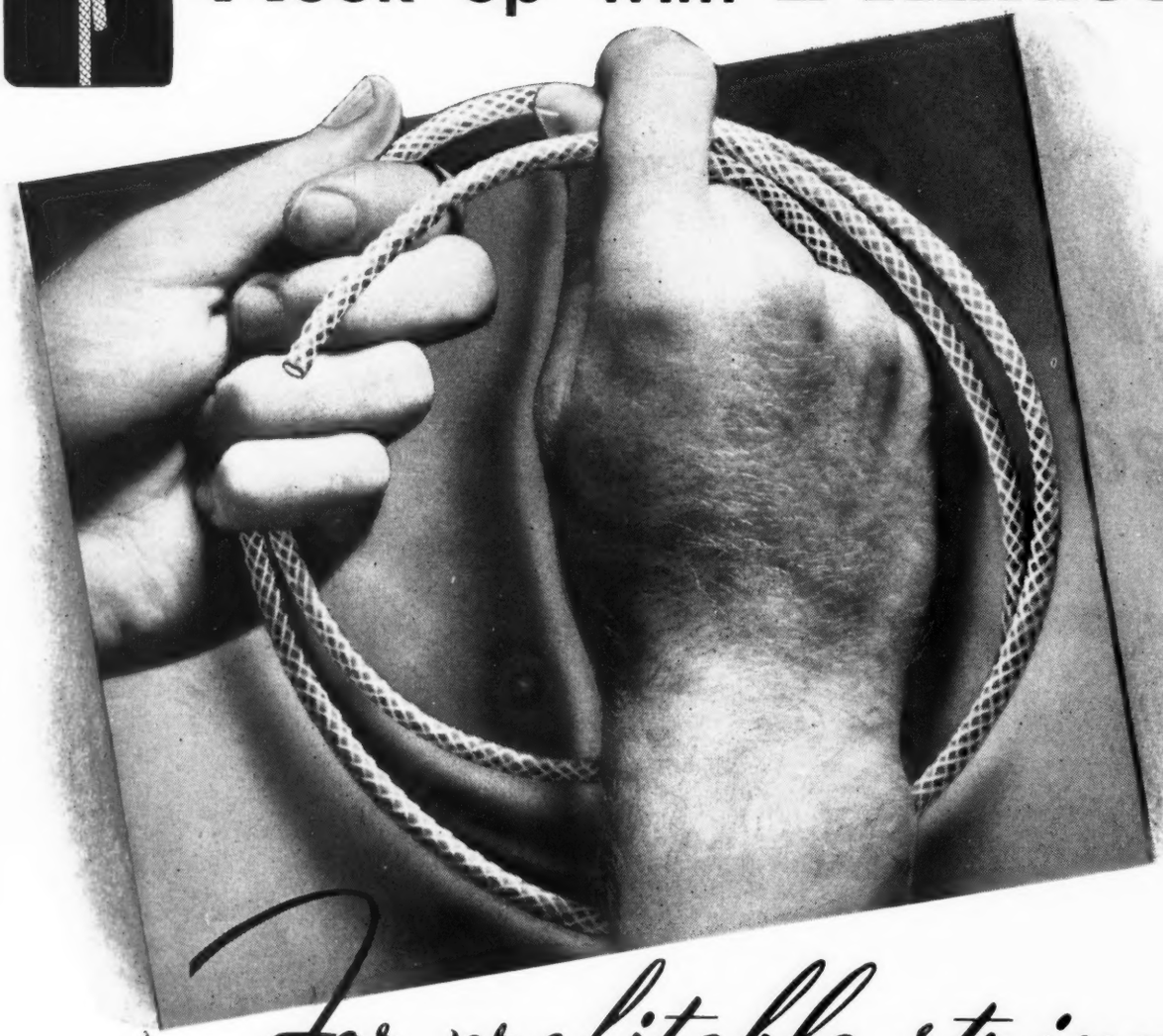

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DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Coal Age

MARCH, 1947

Ivan A. Given, EDITOR

The Big Job

WHILE the Supreme Court and Congress may change things a little, someone sometime in the next few weeks or months is going to have to settle on a new bituminous contract. It might well be the operators and if so it will require the utmost in groundwork, reasonableness in approach and skill in negotiation to get a contract that will promote the interests of the industry, its employees and the public without a work stoppage and further government interference.

It is not necessarily starting at shadows to take cognizance of the fact that a new deadlock might result in the government staying in the picture on perhaps an even more far-reaching scale, in spite of the fact that past government interference and partiality are directly responsible for much of the industry's present difficulties —and in spite of the fact that nationalization is not showing up too well in other countries. True, the war was a nearer thing in many but it also is true that there was little destruction of mining facilities except in parts of Russia. Even the invaders found it to their interests to keep mines in being. Why, then, are most of these countries finding it difficult to meet demands? Part of the answer is excessive government control and nationalization.

The ruling political parties in most of these countries have worked unceasingly to make it appear that management was solely at fault and to make it appear, also, that "social progress" requires close control or nationalization, as in France, Great Britain and elsewhere. But little is said of the government interference in industry operations in these countries over the years, which interference undoubtedly hampered good management and made it easy for bad to stay bad.

Now, Great Britain and others are experiencing at least two of the results of government seizure and operation disguised as "social progress": (1) a tendency to concentrate on rationing of scarcity rather than the harder job of ample production at low cost and (2) operation on a political rather than an economic basis, including endless tinkering by swarming bureaucrats whose main contributions are "You can't do that" and "You must do this," a la the practically late and certainly unlamented OPA in this country. It is to be hoped that those in the saddle in Great Britain and elsewhere will not find it necessary to consider the step that certain other government planners have found logical when they failed in the preliminaries—complete compulsion. However, it is not out of the question.

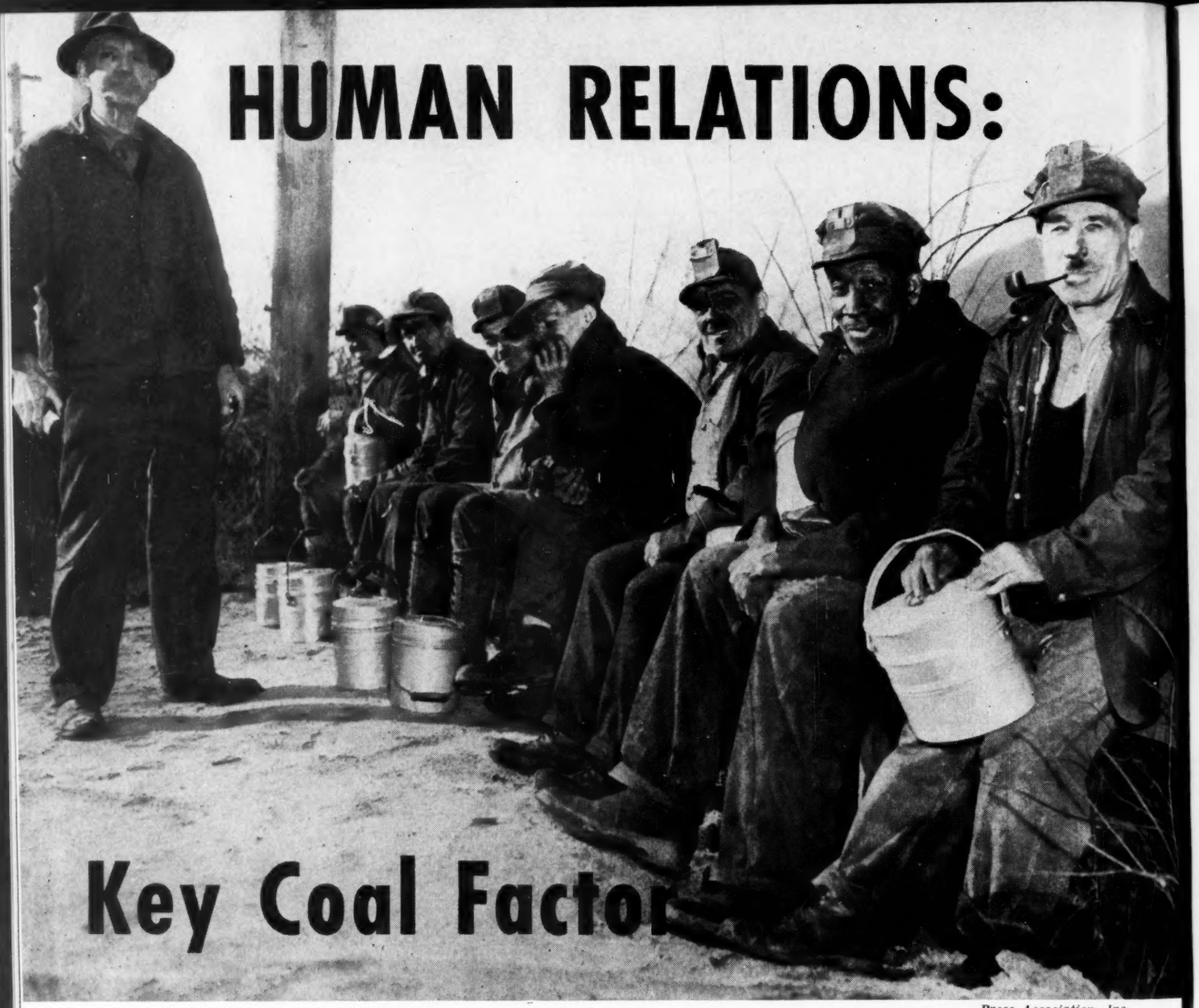
As the only country in the world today to have coal to spare, the United States should give thanks for the fact that its mining industry was permitted to progress on its merits, increasingly rewarding its employees while keeping down cost and improving its service to the public. Reason, understanding and fairness can keep it moving ahead. Government and union officials, as well as the operators, should keep that in mind in the days ahead.

Not Completely Dark

NATURAL GAS is looming up more and more as a coal competitor—not to mention the fact that oil also has something more to reckon with. Big and Little Inch, as expected, are now well on their way to becoming gas carriers and the rush to file applications for new lines to the East, Middle West and Northwest is growing. At least part of them eventually will be built.

Increasing activity therefore permits no blinking of the fact that war lines will be converted and new lines will put natural gas into most of coal's big market areas. However, the tussle will come in getting it on into the consumer's basement. In this, coal need not abandon itself to complete pessimism. If natural-gas lines are loaded up, the events of the recent past, when peak loads could not be handled, undoubtedly will be repeated. If throughput is kept down to permit handling peaks, cost will be higher. In both directions, users may not find natural gas so completely desirable after all. On top of this, the pace in making coal and equipment more convenient and desirable is accelerating and cheaper manufactured gas is more than something to be hoped for. The pressure on coal will increase and the industry must brace itself against some losses—at least temporarily. But intensification of coal's program of research and merchandising can supply the answer—perhaps sooner than one might think.

HUMAN RELATIONS:



Key Coal Factor

Press Association, Inc.

Men are the most important factor in the production equation. Good supervision, based on an understanding of human engineering, leads them to give their best. Self-analysis and study of what men expect in a leader are the tools of a good supervisor.

With manpower the big ingredient in coal mining, human engineering becomes a vital factor in higher productivity and better earnings. In the following material, *Coal Age* summarizes ways and means the mine boss, as management at the face, can get results by applying human-engineering principles.

AS A MINE BOSS, you have up to 25 men or more under you drawing up to $300 or more per day. If you are in a mechanized operation, you have up to $75,000 worth of equipment in your charge (loaders, conveyors, cutters, drills, locomotives, cars, etc.), not counting track, tools, supplies and everything else necessary to getting out the coal. So you can see that you have a rather sizable business for which you have the primary responsibility.

It is your job to make this business—this investment in equipment, materials and wages—pay off. At the face, you are management. To make a success of the business you have to send coal to the surface at a cost that will keep your company in business and you and your men in jobs. Your company has bought the machines and you and your company have hired the men to operate them. To get the best from the machines you have to get the best from your men.

Some time back, the director of personnel in a manufacturing company stated the case pretty well. "Several years ago," he said, "the management learned from experience that whenever production records were broken, whenever misunderstandings were few and far between, whenever absenteeism and

turnover did not present a serious problem, whenever quantity and quality of production were at a high level, the predominating cause could be traced to supervision of a high order in the matter of understanding people, and in a good knowledge and use of time-tested procedures in working harmoniously with people. In contrast to this our management observed that the lack of 'know-how' in working with people tends to cause more strife and grief than would be caused by poor working conditions, inadequate supply of materials or lack of sufficiently trained personnel."

Much the same point was made recently by young Henry Ford II, who said: "If we can solve the problem of human relations in industrial production, I believe we can make as much progress toward lowered costs during the next ten years as we made during the past quarter century through the development of machinery of mass production."

Higher Output—Men and Machines

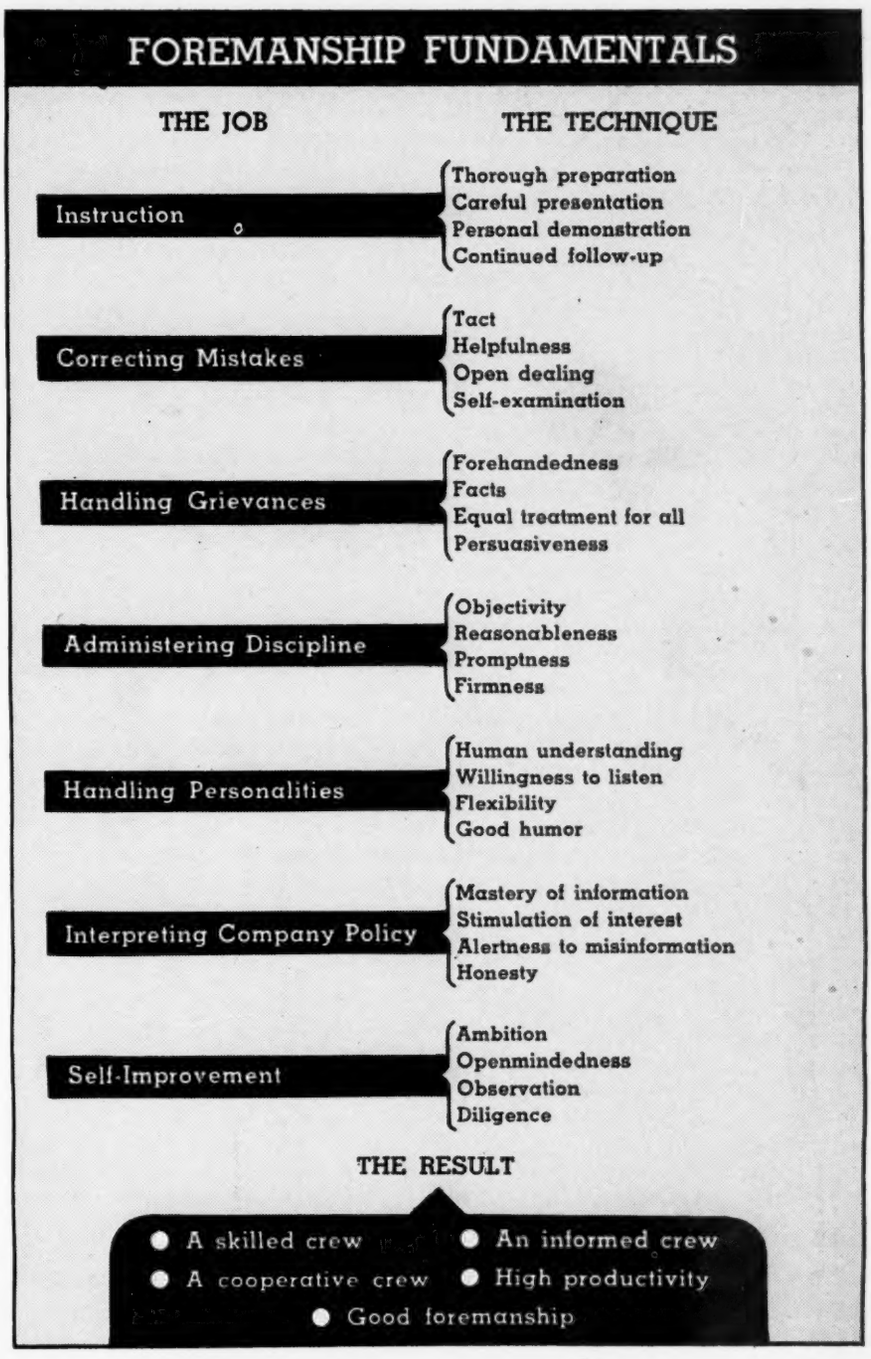
When you come down to brass tacks, then, your job as a mine boss is a human-relations job. The machines will produce if your men work them for maximum output. But whether your men work for maximum output depends mostly on you. You've got to know how to lead them. This doesn't mean babying or giving way to them. Rather it means knowing them, knowing the job they must do and taking the steps that will make it easier for them to work with you toward the common goal.

First step for a mine boss who wants to get along with his men is to learn what they expect their leader to do and what sort of man they think he ought to be. Put yourself in the place of one of your men, or think back to the days before you became a boss. You may have thought your foreman was bad tempered, ill-mannered, suspicious, unreasonable and tyrannical. Maybe you were right. Maybe he was all those things. If he was you must have spent much time calling him names behind his back and dodging the work he gave you. You weren't happy, and you can be sure he was just as unhappy or he wouldn't have been that sort of boss.

What kind of man did you want him to be? What sort of boss would you have liked better and worked harder for? He had to be a leader; that was sure. He had to be a leader who was unafraid of his responsibility or of his own boss, who wasn't afraid of the men who worked for him and who wasn't afraid of honest mistakes, whether they were his or yours. He had to be enthusiastic about his work and his company. It was contagious and you caught it from him. You expected him to stand up for you and scrap for you if he thought you were right. You expected to be called down if your carelessness tore up a machine or your negligence caused a place to be blocked off, but you expected to be treated as a grown person, to be listened to and to be given a square deal in any decision he made.

You wanted your boss to try to understand you as an individual with hopes and fears, a family, problems of your own and limitations of experience and knowledge. You wanted to feel free to talk to him about your mistakes and your ambitions, about your standing and the progress you were making and about the problems that vexed you. When he showed you a new job to do, you expected him to be patient and clear and to teach you out of his own competent knowledge, without showing off or making you feel like a fool. When you needed correction, you preferred it in private, and when you achieved something you wanted him to say a good word to you.

In short, if you had been asked to draw up a list of characteristics you



expected your boss to have, you probably would have ticked off these without a great deal of trouble:

1. **Knowledge of the job.**
2. **Leadership.**
3. **Loyalty both up and down.**
4. **Fairness and open-mindedness.**
5. **Appreciation for a job well done.**
6. **Consideration for your safety, comfort and welfare.**
7. **Good humor and even temper.**
8. **Teaching skill.**
9. **Foresight and careful planning.**
10. **Firmness in exercising authority.**

Are you the kind of boss now that you wanted then, when you started work in the mine? How do your men feel about you? And what can you do to improve their relationship with them? This is the second step: to weigh yourself in the scales and to find out where you can improve yourself.

There's nothing complex about getting along on good terms with other men. In fact, it's simple, and it's not going to make you over into a namby-pamby. All you need is horse sense and a determination to become a human-relations engineer.

Break down your job into its parts. It shapes up something like this: You have to teach new men and introduce new methods to old hands. You have to watch for and correct mistakes. You have to handle grievances. You have to administer discipline. You have to handle men with all sorts of personalities with a minimum of friction. You have to interpret company plans and policies. You have to improve your own standing to maintain respect. And you have to produce coal efficiently. The last item is a lot simpler if you do the others well.

Instruction of New Men

The man just beginning to learn coal mining finds his new environment disturbing. He may tend to feel cut off from the outside world. The darkness, the dampness and the close quarters, together with the unfamiliar noises of cutting machines, loaders and conveyors, are likely at first to make his nerves jumpy. The hazards peculiar to underground mining are much in his mind. The strange faces of the other men in his crew add to his nervousness. He is doubtful about making good on his job, unacquainted with underground rules and methods and uncertain of the sort of man his foreman may turn out to be. He needs reassurance and instruction.

A good foreman can settle the new man down on the job and put him at ease. The very fact that you stay close by for a while may help him keep calm. An introduction to the other men in the crew ought to be the first order of business. Let it be casual but friendly, and then give them all a chance to become acquainted. Next show the new man his job. Plan your demonstration ahead of time, setting up the steps in 1-2-3 order and refreshing yourself on all safety precautions. Go through the operation yourself several times with the new man beside you and then watch him through his paces, offering suggestions patiently and clearly.

After you have turned the new man loose on his own, come back often to see how he is making out and answer his questions. Be sure he knows the things he ought to know—his pay rate and pay-day schedule, checking in and out, the location of supplies, escapeways, danger areas and first-aid facilities, working and safety rules and other things he should be familiar with in his daily activities. Do all you can to make him relaxed and contented with his new job. Study his personal traits and note his aptitudes so you can make allowances for his limitations and exploit his skills for his best advantage and for your own efficiency as a foreman. Introduced to his job in this way, the new man is 95 percent more likely to make a good worker for your crew.

Introducing New Methods

It's easy to take old hands for granted and to assume that they don't need up-to-dating but will catch on to new methods without instruction. Unhappily, it doesn't work that way. Resistance of experienced miners to new methods is often the first stumbling block to stepping up production. They have done the job their way for years and they find it hard to see any reason for changing. As often as not the old hand's opposition grows out of suspicion that it's a speed-up or that it will crowd someone, maybe himself, out of a job. Yet these old hands are a vast potential of productivity and more often than not they're the leaders in your crew. Persuading them that the new way works is a long step toward getting the most out of the new method.

To get a change across to these experienced men requires tact, timing and preparation. You must chart in your own mind the advantages of the new method or the new machine. Does it mean less fatigue? Does it mean higher production and lowered costs per ton? Does it mean added safety? Does it challenge a worker's ingenuity and skill? Slant your presentation to show your men how they will profit by the change. Anticipate their questions and objections and prepare yourself with facts to answer them. Reasonable persuasion is your best method for introducing changes, and it usually works. If you can persuade your men that they had a share in development of the idea and that they have a stake in its use, then your battle is half won. This is a selling job and it takes a salesman's technique, his facts and his persuasive personality to do it. Your experienced miners are the most valuable men you have as long as you keep their loyal support and cooperation. Don't overlook them.

Former miners who come back to coal mining need special handling. In their absence mining methods have changed and their skills have become rusty. Welcome them back. Bring the returning miner up to date on new operations and new equipment. Assess the experience he gained during his absence on another job and capitalize on it. Chances are he returned to coal mining because he preferred it to his interim job. Help him to keep on liking his coal job.

Correcting Mistakes

Few if any of the mistakes your men make are deliberate or malicious. If you'll remember that, you'll save a lot of wear and tear on your temper. Most mistakes are made in ignorance and that's no reason for you to pound the table, shout or make the culprit feel like a fool. You have to be patient but firm.

You have to be always on the alert without seeming to snoop. When you make your rounds, notebook in hand, recording mistakes and jotting down ways to boost production or improve safety or comfort, tell your men what you're writing down. For all they know your notebook is a black book that lists their offenses and perpetuates your grudges. Clear away that suspicion at once.

Show your man that correcting his error will increase his usefulness, boost his earnings in the long run, reduce his fatigue and enhance his safety. Show him that his mistake, once corrected, can be converted into an asset. The proper approach is that you want to be helpful. Talk it out with him, explain the consequences of his error and clarify the right way to do the job, even demonstrating it yourself if necessary. And do it pleasantly.

Above all, don't belittle the man's efforts or try to make him feel inferior. You gain nothing by sarcasm, and it's

about the surest way of making a permanent enemy. Nagging criticism doesn't pay off in production or human relations. Make your criticism constructive and give your men reason to be proud of their work.

In correcting mistakes don't forget to turn an inspecting eye in your own direction. You can't be right every time, you know, and each time a mistake is made there's a chance that you, too, were at fault. Don't hesitate to admit you were wrong if you were. You can't conceal your mistakes from your men any more than they can hide theirs from you, and you might as well not try. In fact, you'll gain a reputation for honesty and square dealing if you come clean.

It's a good idea, therefore, to ask yourself a few questions like these every time there's a mistake in your crew: Did I overlook anything in this man's instructions? Did I tell him fully and clearly what I wanted? Did I plan the job and schedule the materials so that he could do the job with a minimum of lost time and fatigue? Did I confuse him and make him uncertain by losing my temper or hurrying too much? Have I done all I can to promote teamwork among my men? Have I streamlined my record-keeping to give me more time for direct supervision and on-the-job instruction? Have I set a good example for my men in diligence, good humor and caution? Honest answers to these questions may get at the root of many of the mistakes in your crew.

25 KEYS TO BETTER SUPERVISION

1. Do I show a personal interest in each of my men?
2. Do I have a reputation for fairness and impartiality?
3. Do I study each man for his assets and his limitations?
4. Do I use tact in dealing with my men?
5. Do I listen attentively to complaints and suggestions?
6. Do I show an interest in helping my men get ahead?
7. Do I show an interest in the safety and welfare of my men?
8. Do I treat my men with courtesy and consideration?
9. Do I keep my voice pleasant?
10. Do I praise my men when they perform well?
11. Do I know my weaknesses and try to strengthen them?
12. Do I control my temper?
13. Do I avoid ridiculing a man who makes a mistake?
14. Do I state my criticisms in private?
15. Are my instructions always clear and reasonable?
16. Do my men feel that they are working with me rather than under me?
17. Do I get the facts and avoid jumping at conclusions?
18. Do I state the reasons for my decisions?
19. Do I promise only what I can deliver, and then do I deliver?
20. Do I handle grievances properly and promptly?
21. Do I prepare teaching sessions in advance?
22. Do I pave the way for changes in method and policy?
23. Do I schedule supplies and output for highest efficiency?
24. Do I take criticism gracefully, and do I profit by it?
25. Do I look for ways to improve myself?

Handling Grievances

The first move in handling grievances is to prevent them. That means being always wide-awake to detect and remedy conditions that your men might complain of. It also means treating complaints with a respectful and open mind and doing all you can to keep them from becoming grievances. Trouble is easily stopped at the complaint stage but it's hard to handle when it grows into a grievance.

Be on the watch, then, for conditions that may produce dissatisfaction —water, smoke, unsatisfactory supplies, broken-down or dangerous machines, bad air, inefficient transportation and so on. Do all you can to correct these conditions before someone complains. If a worker does complain before you've removed the cause for complaint, hear him out patiently, show him the notes you made about correcting the condition and then double your efforts to get the change made immediately.

Be sure you play no favorites. That's a frequent cause of complaint, and it hurts the man you favored as much as it hurts you. Distribute desirable and undesirable work evenly among your crew and show your regard openly for their health and safety. Stand by to see that every man gets all the pay he earns. Recognize each man's achievements with a friendly word. Keep your crew informed about the reasons for rules and regulations, policies and orders. In these ways you can cut complaints to a minimum.

Get all the facts before you try to settle a grievance. Listen attentively to every man who has anything to say, but keep the discussion factual. Review the present case in the light of your experience with other cases. Don't object to calling in a third party; if you're right, he'll back you up. Keep yourself in a conciliatory frame of mind and be prepared to give in on a few minor points to win your main point. Admit merit whenever you see it in the arguments of the other side, but state your own case clearly and persuasively. If you lose your point on review by higher authority, accept your defeat gracefully and study it to see where you were wrong. Don't let yourself be pushed around. On the other hand, don't tear your shirt. Bad temper will lose your case for you more quickly than ignorance of the facts.

Administering Discipline

Here's one of your toughest jobs. It can make you or break you. To do it right you've got to steer a middle course between being a pushover, with your men running roughshod over you and your discipline a species of low comedy, and a rough-shod rider, with your men calling you every name in the book and doing all they can to sabotage your record. Handing out discipline takes a cool head and an open mind, lots of common sense and judg-

ment, an understanding of human nature and a store of factual information.

Time-tested guideposts mark the way to good discipline administration. First, be sure you've got the facts—all of them. Look at the record. Talk to the man's fellow-workers. Examine the place where the rule was violated for conditions that may have caused the violation. Then, in private, talk with the man who broke the rule. Listen carefully and get his story in full. If there seems to be a reason behind his infraction of the rules, give him the benefit of the doubt. Don't be suspicious of the motives; put a little faith in human nature.

Once you've got the facts, put them all together and see what they add up to. Weigh the effects of the violation on production, morale and safety. Keep your personal likes and dislikes out of the picture. If you think you need it, ask advice from another foreman or from the mine manager or superintendent. In any event, make your decision as quickly as you can, with due regard to the facts in the case and the principles of justice. Light discipline administered promptly often gets better results than delayed rough treatment.

When you've made your decision be prepared to stick to it and make it stick. You can do that without being cocky or highhanded. Call the man up and tell him what your decision is—always in private. Be firm, but don't be unpleasant. Don't hand out his penalty as if it were punishment or revenge. Make your penalty corrective and constructive. If the man objects, hear him out but keep him talking about the facts, not about what he imagines. If you keep him close to the facts, chances are he'll cool down. Try to make him see that your stand is reasonable and that you want to be helpful. If a blow-up does come, re-examine the incident later to find out what caused it and what could have prevented it.

Handling Personalities

Each man in your crew is different from all the others. He has his own ambitions, his own desires, his own personal problems, his own temperament and his own limitations. He doesn't leave these individual differences at home when he comes to work. He brings them down into the mine with him. They are important, these personal traits. Because they set him apart as a personality, he's likely to be proud of them and demand respect for them. The measure of your success as a human-relations engineer depends largely on how you cope with him underground.

With most of your men you'll have no trouble and your relations will be those of normal human beings. Show them that you, too, are a normal human being. Call them by their first names, ask about their children and talk with them about their plans and their jobs. See to it that your conversation is a two-way exchange, not a monologue on your part. Listen sympathetically to a man's recital of his troubles; talking about them may get them off his chest. If his work slacks off, try to find out why, without being too inquisitive. Maybe you put him to work without assessing his limitations or his skills. He may be better equipped to be a motorman than a shotfirer.

Go out of your way once in a while to do your men a favor. Keep up their interest in the job by showing your interest in their progress. Build up their feeling of security by showing them the importance of their job. Keep your good humor and your sense of balance and act like a normal person, not like a stuffed shirt.

Applying Psychology

If you do have problem workers in your crew, a little applied psychology can do a lot of good. Remember that people try to adjust their difficulties in different ways and that bluster, temper, bragging, risk-taking and timidity are only some of the ways people take of solving their problems or covering up their limitations. Take each case on its own merits and put some horse sense to work on it. If your man is shy, encourage him, look for chances to praise him and be patient and friendly with him. If he is over-anxious, show him that trying too hard makes him tense and more subject to mistakes and accidents; help him to ease off. If he shows no initiative, tell him about your confidence in his ability and urge him to try out his ideas; from time to time ask him for suggestions. If he is high-strung and vain, praise him openly—he thrives on praise—and ignore his temperament unless it interferes with your crew's production. If he is inclined to put things off, fix your deadline and stick to it; check up on him often. If he is cocky and inattentive, watch him closely until you see a serious error, then let him have it; show him that he, too, can still learn. If he is a chronic griper, ask him for constructive suggestions and tell him to put them in writing; nothing deflates a blusterer like having to write down his imagined complaints. If he is quick-tempered or surly, be calm and talk to him in a steady voice; get him off alone and show him how his excitability distracts his fellow workers and gets in the way of his own progress.

Interpreting Policies and Plans

You can do some of your best work here. Most of your men are interested in the company. Those who aren't interested will be better workers if you can rouse their interest. The more your men know about the company, the more they'll feel a part of it. It's your job, as management-on-the-spot, to keep them informed.

Master information about the company yourself and then share it with your men. Angle your presentation to show them their stake in every company activity from face to sale. Pave the way carefully for enlargement of activities, curtailment of operations and personnel shifts, if and when they occur, by explaining the reasons for change. Answer their questions honestly and as fully as you can. Ignorance breeds suspicion. So if you don't know the answer right off, find out as soon as you can and then pass the word along to shut off idle speculation. Stand ready to correct misinformation whenever and wherever you find it.

Improving Your Own Standing

To be fair to yourself, your company and your men you've got to improve yourself. Stay up to date on operating ideas. Be alert to see new ways of getting the job done. Keep your mind open for suggestions. Plan some sort of study for your off hours. Watch other foremen who are successful and learn what you can from them. As your stature grows in job know-how and human-relations skill, you'll find the respect and appreciation of your men keeping pace.

If you put these ideas to work in dealing with your crew, you'll find your men and your equipment paying better returns. You'll have a crew of skilled miners working with a new spirit of friendly cooperation for themselves, their company and you. You'll have fewer grievances to nurse along through time-costly settlement procedures. There will be a free flow of information from the top down and from the lower levels upward, with a mutual understanding of problems. On your part there'll be a new understanding of your men; on theirs, a new respect for you as their foreman. The end result will be increased productivity for your crew and a better rating for you as a boss.

Track-mounted drill moving to another room.

DRILLING COST CUT

By Mounted Unit With Hydraulic Controls

Change From Post to Track Drills With All Motions Hydraulically Powered Permits Drilling to Be Handled by One Man at Isabella Mine—Special Bits Also Speed Drilling—Drawslate Shot With Coal

TRACK-MOUNTED DRILLS have boosted output per man and reduced maintenance costs at the Isabella mine of the Weirton Coal Co., Isabella, Fayette County, Pa. Only one driller is required per machine. Special drill bits and a high feed rate economize the operator's time.

For nine years, ever since Isabella's mechanical-mining program was initiated in 1937, post-mounted drills had been the standard equipment on all loading sections. In 1946, Isabella changed to the Jeffrey 56-A track-mounted drill. This machine, equipped with hydraulic controls, makes it easier for the operator to drill the holes at the correct place, to the required depth and at the proper angle. Holes, if need be, can be drilled parallel to and near the top, bottom or ribs in places as high as 7 ft. and as wide as 30 ft. At Isabella, solid-work places are 12 ft. wide; pillar places, 18 ft.

The 4-ton drilling machine is 5 ft. 2 in. wide and 16 ft. 4 in. long in tramming position. Over-all height, in the same position, is 51 in. A 11-hp. motor trams the four-wheeled unit at speeds of 3½ to 6 m.p.h. depending upon grades. Power can be received through either trolley pole or cable reel. A 3-hp. drill motor turns the feed bar at 250 r.p.m. and the auger advances 42 in. per minute.

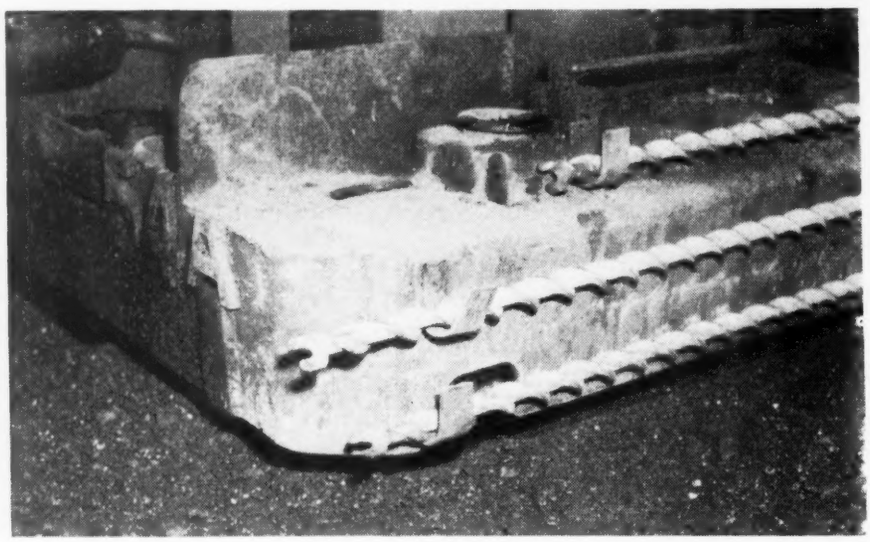
Drillers at Isabella do not move in to drill until the track has been extended and the place timbered. By then, the assistant foreman (section boss) has marked the location of each hole to be drilled. Because only one driller is used per loading unit, instead of the two required under the old method, man-hours of exposure at the face for this type of work has been reduced by at least half. The drilling operation also has been made safer and easier by the fact that the driller is not

required to handle anything heavier than a 9-ft. auger. When drilling, the driller stands well behind the revolving auger and the incased thread bar which makes it impossible for him to catch his clothing in the auger. He is the only one who manipulates the controls. As the illustrations show, the driller, when he stops the machine to change augers, is well clear of the auger when he steps back to start it again.

Along with the change in drilling equipment, a new timbering machine (*Coal Age*, February, 1947) made its debut at Isabella. This timbering machine, in accordance with the prescribed cycle of operation, goes ahead of the drilling machine. After the timbering machine and its crew of two men have completed their work, a place is timbered to within not more than 10 ft. of the face by a 6x6 in. crossbar wedged tight against the roof and resting on two 6-in. round posts set against each rib. The result is that when the driller moves in, he can stand under this crossbar to do most of his work. This, of course, affords him extra protection.

As soon as the driller spots the machine at a new face, with the front axle approximately 8 to 10 ft. away, he is ready to go to work. The positioning of the drill is done through the hydraulic controls. Without such controls for moving the turntable, the machine would usually require two men. Thus, a completely mechanized unit releases one man for other work and makes the job of the remaining man a less arduous one. As the track is laid on sights and the rails extend to within 2½ ft. of the face, the driller uses the near rail as a guide for getting the axis of each hole parallel with the center line of the heading. The Isabella drilling plan calls for all holes to be drilled parallel to the center line of the place. None of the holes are drilled level. The top holes are slanted up through the drawslate and made to touch the "wild," or "rooster," coal. The bottom holes are pointed down to touch the bottom slate at the back of the cut.

Kennametal drill bits advanced 42 in. per minute have materially reduced

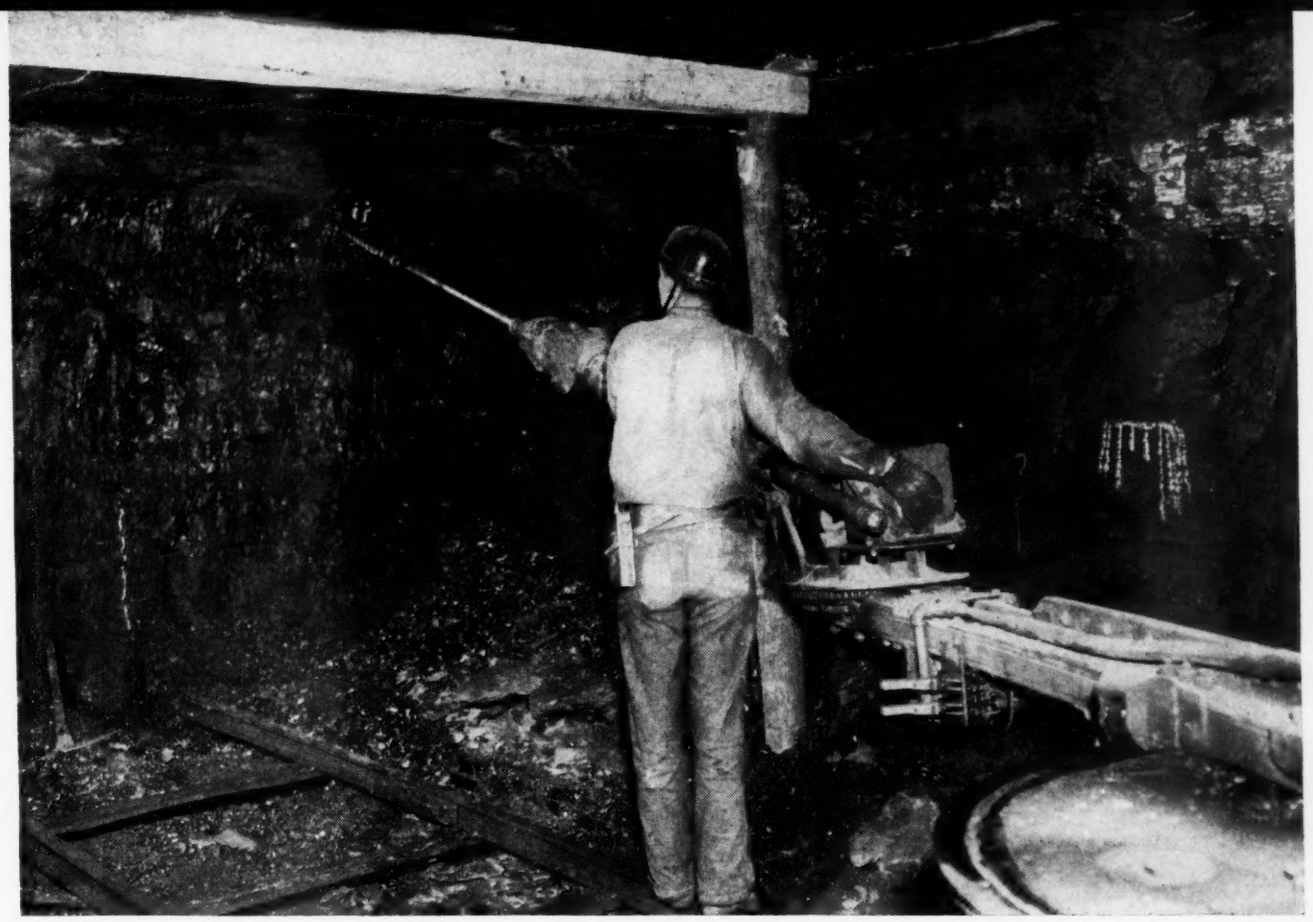


A special 2-in. bit is fastened rigidly to each 3-, 6- and 9-ft. auger section.

Isabella Personnel

G. M. Rigg, Manager
George N. McLellan, Superintendent
C. W. Lotz Jr., Mining Engineer
W. D. Heller, Master Mechanic
E. B. Jolly, Chemist
G. L. Kemp, Chief Electrician
J. L. Willetts, General Mine Foreman
William Keeney, Night Mine Foreman
Peter Serinko, Chief Assistant Mine Foreman
Roy Dayton, Chief Assistant Mine Foreman
John Novotny, Chief Assistant Mine Foreman

The foreman is responsible for marking the location of all drillholes.



The top holes are angled up through the drawslate since full-seam mining is practiced. Track is extended and the place timbered before the driller moves in.

the drilling time per face. The three augers, 3-, 6- and 9-ft., respectively, have separate drill bits. Approximately 60 holes are drilled between bit regrinds and each bit is good for 7 to 10 regrinds. Since each hole can be drilled more quickly the driller now can take more time to get the holes absolutely on the desired line—parallel with the center line of the place and with the right angle up or down.

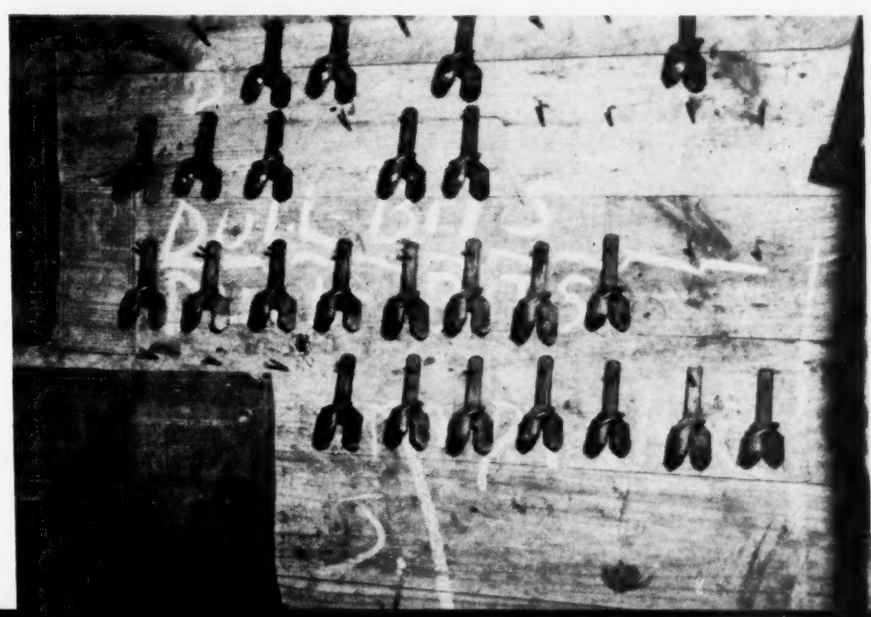
The new drilling machine has helped speed up the preparation cycle at Isabella. This is a significant factor since on-shift shooting is the practice. It is not uncommon to find loading machines, at many mechanized mines, crowding the face-preparation units. In those cases, the loader is hounding everything else on the section. Such is not the case, however, at Isabella. With the new timbering machine and the track-mounted drill, together with the original Jeffrey 29 U universal-type track-mounted cutting-and-shearing machine, the face-preparation units have gained on the loader so that preparation and loading are now more nearly in balance.

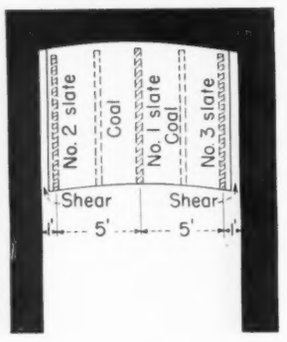
Complete-seam extraction, rather than selective mining, is the rule at Isabella. Coal-seam conditions were in large part responsible for the change some years ago. The cover over the Pittsburgh seam at Isabella runs as much as 675 ft. and averages 450 ft. The main roof, consisting of a 6- to 10-ft. layer of dark-gray shale overlaid with sandstone, varies from very weak to medium strong and usually disintegrates rapidly on exposure to air. Under it is a 3- to 10-in. layer of "wild" coal, which makes a fairly strong immediate roof if supported by crossbars, while the uniformly 12-in. thick layer of drawslate immediately over the coal is very weak and treacherous.

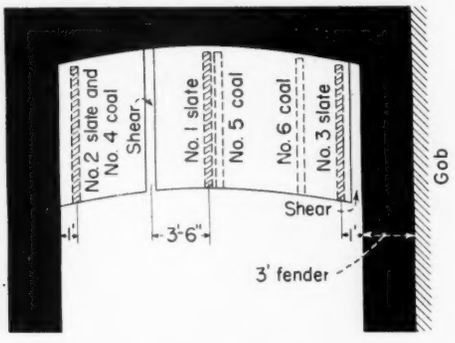
The floor has numerous irregular bottom rolls, or horsebacks, protruding from a few inches up to 3 ft. into the coal. Although the bottom slate (2 to 6 in. thick) usually is hard, the underlying fireclay (2 to 4 ft. thick) when damp causes it to buckle and heave readily with any moderate increase in roof pressure. As a whole, the bottom is weaker than the main roof. The coal seam proper averages 7 ft. in thickness.

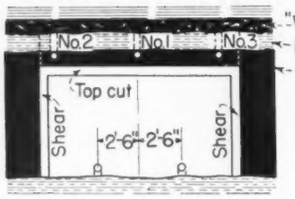
Holding the drawslate by leaving 8 to 12 in. of coal was attempted when mechanical mining was begun. This did not work out and the mining practice was changed to full-seam mining, including shooting and loading the drawslate along with the coal. Trouble from falls was materially reduced and

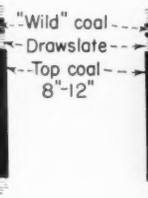
Spare drill bits hang in each section tool station.











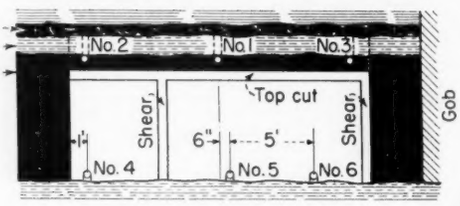


Fig. 1—Five holes are drilled in 12-ft. places in solid work. The slate holes are angled up through the drawslate and just touch the "wild" coal.

Fig. 2—Six holes are drilled in 18-ft. lifts in pillar work. The bottom, or coal, holes are angled down to touch the bottom slate at the back of the cut. The coal is top-cut and sheared twice.

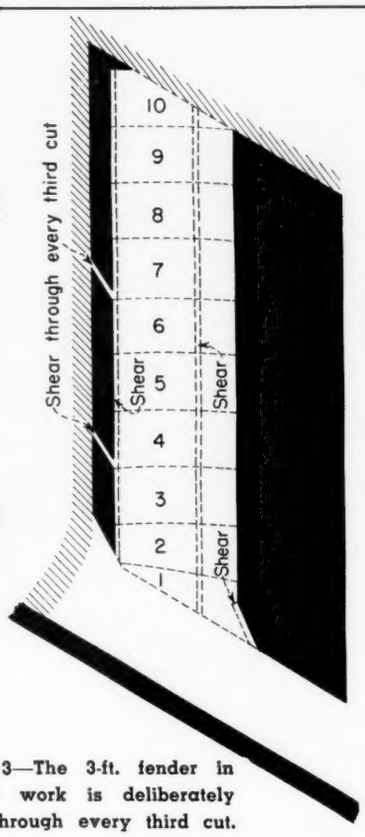


Fig. 3—The 3-ft. fender in pillar work is deliberately cut through every third cut.

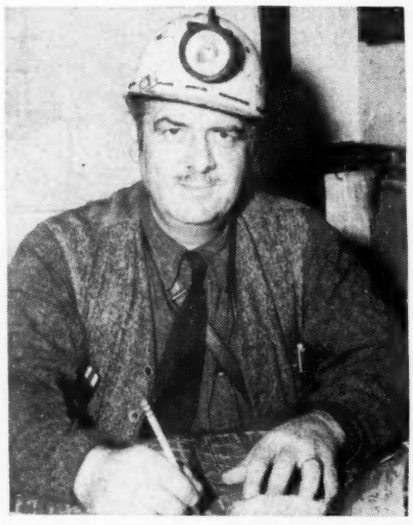
working height was increased, making possible, among other things, heavier loading of the cars and better recovery per acre.

The drilling plan for solid places (Fig. 1) is based on five face holes. The three slate holes are started at the edge of the coal and angled up through the drawslate. These holes are drilled to the "wild" coal but not into it. Both coal holes are started not more than 8 in. off the bottom and are angled down to touch the bottom slate at the back of the cut. No undercutting is done. Instead, both ribs are sheared and a cut is made across the top, leaving 8 to 12 in. of top coal to be pulled by the charge in the slate holes. The slate holes are shot in the order shown and before any of the coal holes.

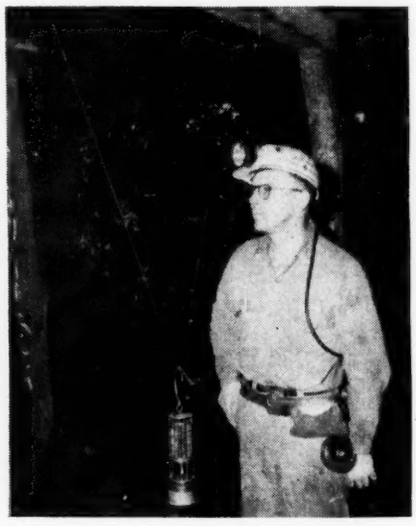
The drilling plan for 18-ft. pillar places (Fig. 2) differs from Fig. 1 only in the number and spacing of the holes. Six holes are used: three slate holes and three bottom, or coal, holes. In addition to the top cut from rib to rib, two shear cuts are made. This provides a number of free faces for the various shots. The top holes are charged with 1½ sticks of permissible explosive and the bottom holes with 5½ sticks. The holes are shot in the order shown to give all possible protection to the fender next to the gob.

Fig. 3 shows how the fender is deliberately cut through to the gob about every third cut. Most fenders are so thin that they crush readily when the falls are made. Any solid stump is drilled and shot in the process of making falls.

With the track-mounted drills and timbering machines a section crew consists of 14 men, plus the assistant foreman in charge. The crew members are assigned as follows: loader operator and helper, motorman and snapper, cutter operator and helper, driller, shotfirer, two timbermen and four trackmen. To average up the night work all three shifts rotate once each week. The crews, along with their assistant foremen, rotate backward and the chief assistants rotate forward each time. This gives each chief assistant a new shift group each week but leaves each crew with its own boss.



J. L. Willetts, general mine foreman, keeps close watch over each week's production from the 126 machine shifts.



Walter Collins, assistant foreman, helps run the sights—an important factor in keeping places in shape for high efficiency.

ANTHRACITE

Moves to Increase Colliery Productivity

While Pressing Use of Present Types, Anthracite Will Try Four New Machines to Raise Productivity, Including Gangway Driver, Shearing Machine, Coal Planer and Pneumatic Backfilling Unit

WITH THE PROBLEM of getting higher efficiency in underground mining growing more pressing, anthracite producers are preparing to try a number of new machines for use in thin and pitching beds as well as elsewhere. Meanwhile, they are increasing the number of conveyors, scrapers and other conventional equipment, including duckbills, and are working to bring home to the miner the need for higher productivity as a means of preserving and expanding the industry's markets. Thus, the industry is moving to match progress in research, evidenced by new laboratory facilities and intensified work on projects already under way, with equal or greater progress in the field of productivity and cost.

Industry Cooperates

Along with individual efforts, anthracite is working cooperatively with the U. S. Bureau of Mines in testing and developing the new machines already alluded to. The Bureau's share of the activities are under the supervision of John W. Buch, mining engineer, and the four units so far chosen either have reached the stage of trial tests in the field or are on the agenda for this year. Listed in their order of appearance, they are: a combination scraper loader-shaking conveyor unit for gangway work capable of loading 12 pit cars between locomotive visits; a shearing machine ready for trial in the Southern Field; a vibrating-type edition of the German "Kohlenhobel" coal planer; and a pneumatic packing machine for filling old workings to minimize or control subsidence.

The scraper loader-conveyor unit being tried in Western Middle Field is designed for driving water-level gangways in steeply pitching seams 4 to 6 ft. thick. This unit, which is completely air operated, has a shaking conveyor swung from the roof for moving the material from the conventional scraper dumping point to a car-loading station approximately 100 ft. away. In effect, the conveyor converts the scraper-loader into a loading machine with an extra-long boom. Instead of a single mine car, a 12-car trip can be pushed back under the pan line. Then, by using a small hoist to inch the trip along, the entire trip of 12 cars can be loaded at the end of the pan line.

The storage space under the pan line makes it more convenient for a locomotive to serve this unit and at the same time serve chute stations over a considerable area. In addition to conserving the time of a locomotive and its crew, gangway operations will be speeded up. A cut will be loaded in less time since, with a 12-car trip, there will be no waiting on cars and no time lost in switching to the next car in the trip.

Other recent developments in anthracite mine transportation include a decision to install a belt conveyor for bringing coal from the Dunmore vein to the surface, eliminating a hoisting shaft at a property in the Northern Field. The 2,600-ft.-long 36-in. belt

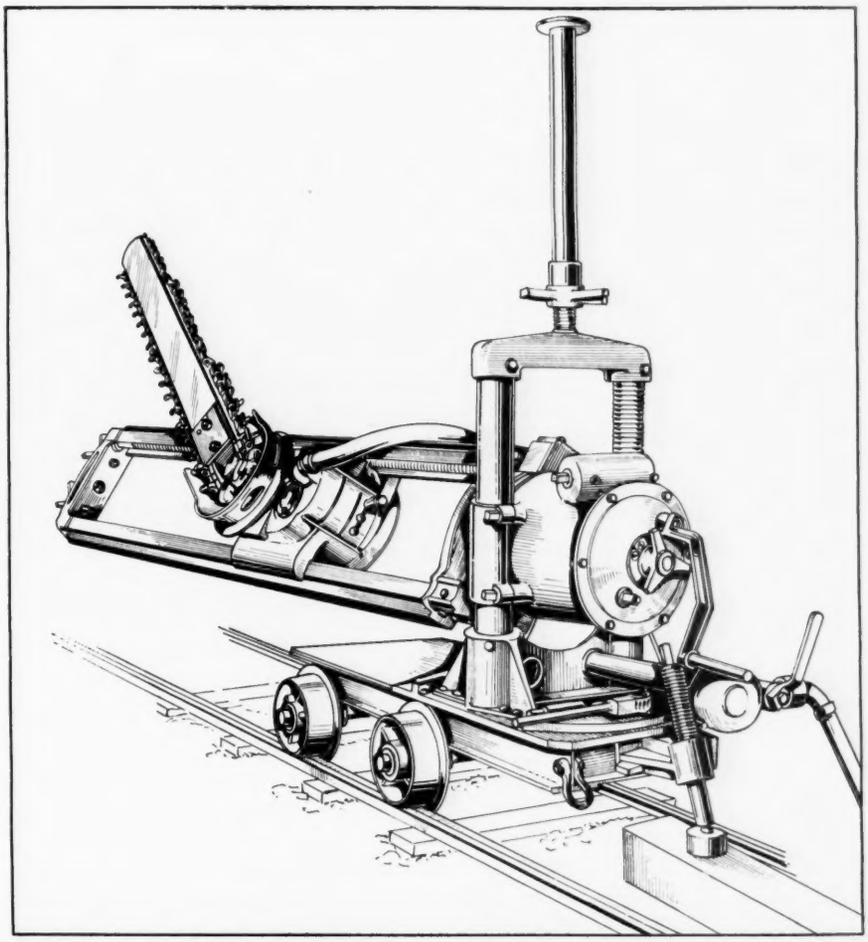


Fig. 1—The 20-hp. air-operated universal shearing machine scheduled for trial has a 7-ft. bar and cuts a 3½-in. kerf.

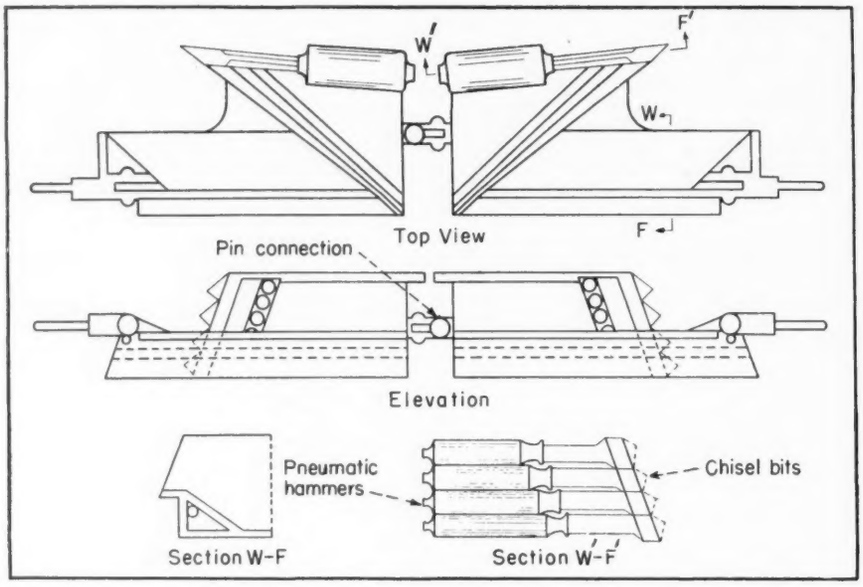


Fig. 2—The pneumatic-hammer principle from the Flottmann hewer will be incorporated in the design of the vibrating-type coal planer for the anthracite experiment.

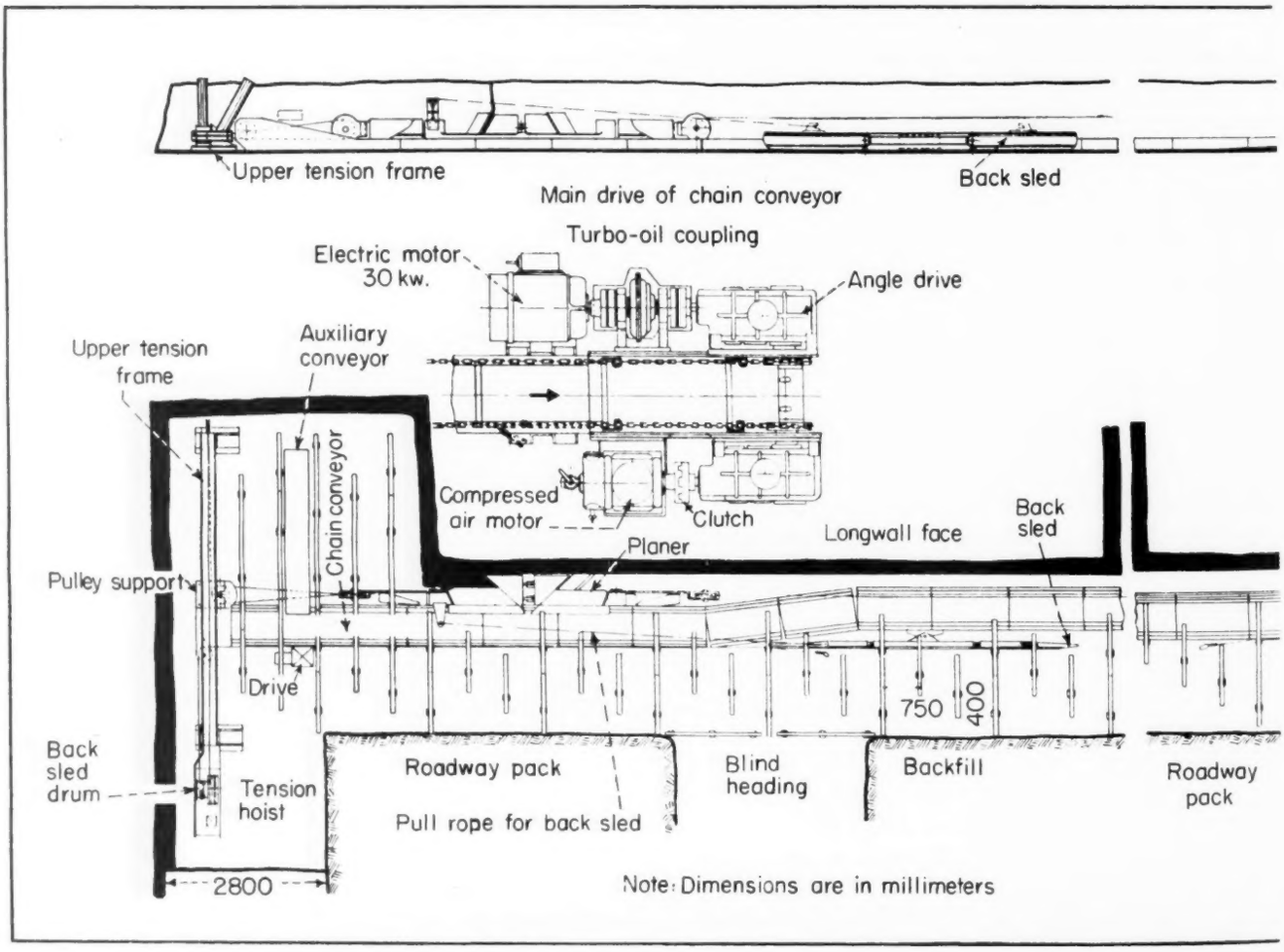
unit will be placed in a 15-deg. slope with a difference in elevation of approximately 670 ft. between top and bottom. More than a mile of belting will be vulcanized together to form an endless belt conveyor.

At another operation, a belt is employed to move coal from a thin vein to a thicker vein for loading where it is cheaper to install and maintain a rail haulage system (*Coal Age*, July, 1945). Here, the interval between the Top and Bottom Ross is 15 to 20 ft. and it was decided to mine the Top Ross with shakers and belts and convey by belt to the Bottom Ross for loading into cars. This, of course, eliminated driving extra gangways in the Top Ross and the taking of bottom rock for haulage headroom.

At still another operation, in the Southern Field, a slope belt has been under consideration as a means of gathering coal, and perhaps rock, from several veins and bringing it to the surface. It is thought that blending the coal from the various veins on the belt itself might be desirable.

Since driving rock gangways is expensive, consideration is being given to types of transportation that will reduce or eliminate this operation, thus speeding territorial development and reducing production costs. Gangway costs at some operations are too high for second and third mining to be

Fig. 3—The face layout for the anthracite coal planer will be similar to this plan used in the Friedrich-Heinrich mine in Germany.



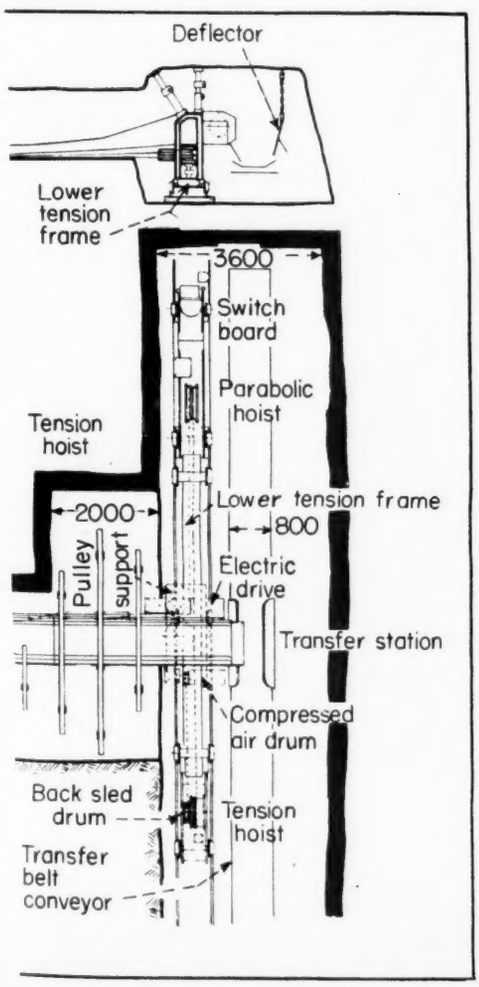
profitable. From the standpoint of gangway driving, it has been observed that where mechanical mucking is employed, though not always with full effectiveness, gangways advance 2½ times faster than if hand mucked.

To Try Shearing Machine

Pitch and other conditions hitherto have required that most anthracite be shot off the solid. To extend the benefits of cutting, preparations are being made to try out a lightweight crawler-mounted 9-hp. air-operated German shearing machine. This unit, which cuts only in a vertical plane, is to be tried in the Southern Field. Later, a 20-hp. universal-type German Korfmann machine will be available for tests.

Part of the success of this machine will depend upon good air pressure at the face. Many old collieries have experienced trouble with compressed-air systems as a result of low pressure at the extremities of the system. Usually, trouble results because mains and laterals were started with too-small pipe.

"Friction head" in pipe is encountered with air as with water, with resultant drop in pressure. The effect is proportional to the length of the pipe line and is much more pronounced as pipe diameter decreases. For example, the loss in pressure for 3-, 2- and 1-in. lines 1,000 ft. long, with a flow of 150 cu.ft. of free air per minute at 100 lb. gage (19.23 cu.ft. of compressed air per minute) is 0.21, 1.72 and 62.8 lb. per square inch, respectively. The pressure drop in a 2-in. line is more than eight times that for a 3-in. line, while the drop in a 1-in. line is 36.5 times that in a 2-in. Therefore, the size of the pipe in the various lines is important if a working pressure of 85 to 90 lb. is to be maintained at the face.



Boosting Air Pressure

One way of boosting pressure in an old system without laying larger lines is the installation of booster compressors at strategic points throughout the system. In laying out a new system an operation has two choices: (1) to install all compressor equipment on the surface and lead off with large mains, perhaps 10-in., and gradually reduce to 1¼-in. lines near the face; or (2), to locate part of the compressors on the surface and use booster units at various points underground, making the connections between them with medium-sized lines.

One newly planned system followed the latter scheme, using compressor stations on the surface and underground. It has standardized on three pipe sizes for mains—6-, 4- and 3-in. The lines are reduced to 1¼ in. at the face. As the mine is developed, the pipe for the various mains and laterals is installed according to a plan made by the engineering department and checked by a compressor manufacturer. This plan is adequate for the life of the operation and will provide a working pressure of at least 90 lb. at all points. Furthermore, it will never be necessary to change to larger pipe on the mains to correct for low pressure.

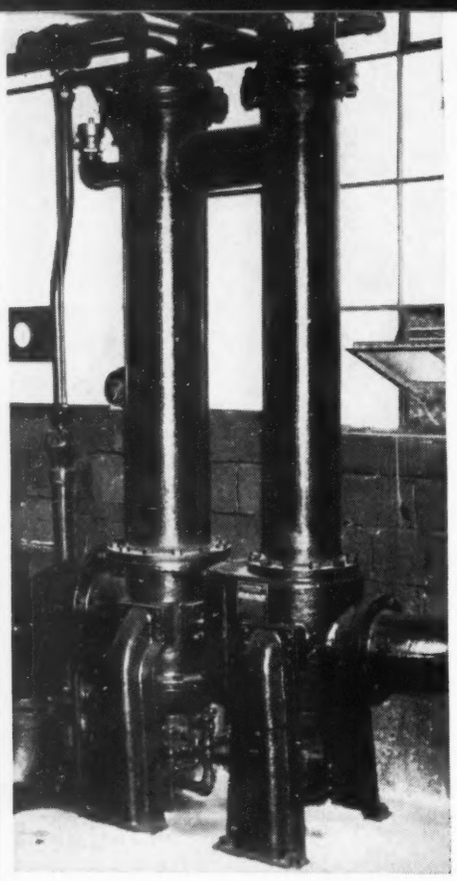
A fluctuation in pressure caused by a large momentary demand for air can be minimized by the installation of receivers. However, considerable receiver effect can be obtained by using large mains and many companies take this into account in planning their air layout. Next to low pressure, one of the most troublesome things about a compressed-air system is moisture. After compression, the air cools and the moisture present condenses. This water is carried through the lines to tools and machines where it tends to wash away the lubricants, causing excessive wearing of parts and bringing about increased maintenance costs. A solution to moisture troubles—a remedy which has only recently been applied in the anthracite region—is the use of an aftercooler in the circuit following the compressor to trap and dispose of the moisture.

Aftercooling compressed air reportedly eliminates: (1) washing lubricant away from tools and machines; (2) freezing of moisture in valves, ports, etc.; (3) the possibility of explosions or fires in receivers or piping; and (4) straining of lines from alternate expansion and contraction. The aftercooler removes 90 percent of the moisture and oil vapor immediately after compression and before the air enters the distribution system. It reduces the temperature of the air to a point where most of the moisture and oil is condensed by bringing the hot air leaving the compressor into contact with pipes through which cooling water is constantly circulated.

Cooperative tests of a third new mining device, a vibrating-type coal planer patterned after the German "Kohlenhobel" machine used in the Ruhr district during the last war, will get under way later this year. It is not known what the machine will do in hard coal and part of the work will be to find out more facts affecting the design of the planer, the rope pull of the hoist and so on. The unit is to be tried at a colliery in the Northern Field. The information on the German coal planer which follows was taken from the Bureau of Mines Information Circular 7377, which was prepared from data obtained in July, 1945, by Mr. Buch as a member of the Solid Fuels Mission to the European Theater of Operations organized by the Technical Industrial Intelligence Committee of the Joint Chiefs of Staff.

A Wartime Development

The German coal planer was the outstanding wartime development in the mechanical mining-equipment field in the European theater and helped to maintain the output of high-grade coals from the Ruhr district in the face of a shortage of skilled miners. The planer, fashioned after the ordinary wood plane, is pulled along between a chain conveyor and the coal face. As it slides along it planes a cut 12 in. deep to a height one-third to two-thirds of the seam's thickness. The coal is "ploughed" into a conveyor and carried away. The upper part of the seam either caves or is barred down and is loaded on the return trip. With the coal planer, drilling and blasting are eliminated and cutting, or peeling, and mechanical loading are performed in one operation. The machine was used with the semi-longwall system where



Solution to a major anthracite problem—this aftercooler removes water and oil vapor before compressed air enters the distribution system.

the pitch was less than 30 deg. and in thin-bed areas that had already been developed in the normal course of operations. With this unit, it was possible to get high production from a minimum number of working places, thus making it feasible to mine thin-bed areas.

Three Needs Met

The German objectives in developing new mining equipment and methods were: (1) increasing the effectiveness of the skilled miner, (2) maximum output from available working places through the elimination of dead-work shifts and (3) increasing productive efficiency in the thin beds so that coal not considered economically minable, but which had been developed in the normal course of operations, could be mined.

Before the end of the war, the Germans had standardized on the solid-blade type of planer, with the Hannover-Hannibal, Monopol and Ibbenbüren models finding the most favor. The cutting edge of the Monopol model, instead of being smooth, was made of sectional blades mounted to produce a sawtooth effect. In general, these units were best suited for mining softer coal seams of moderate pitch or the harder beds when the roof pressure was used to help free the coal. One month's production from a unit was as much as 22,500 tons from a 660-ft. face in 5-ft. 7-in. coal pitching 2 deg.

The standard-design coal planer consists of a fabricated steel-box frame (blade holder) with a ramp for discharging the coal into the face conveyor, a cutter blade or planer bit, a forward scoop that forces the loose coal from the path of the planer over into the conveyor and a forward arm which accommodates the sheave for the pull rope. Two units are joined together back to back to provide a unit which will cut in either direction of travel.

Planer Requires Two Hoists

Rope hoists located at the ends of the longwall face pull the planer along between the conveyor and the coal face. The blade height is one-third to two-thirds the seam thickness. Cutting depths from 4 to 31.5 in. have been tried but the 12-in. cut seems to be most satisfactory. The 43-deg. blade angle employed in the Ibbenbüren planer has proven effective in governing the entering and digging action. A 55-deg. blade angle provides foot-lead counteracting the tendency of the planer to climb.

At the end of the war the Germans were experimenting with two vibrating-type blades on coal planers for mining hard bituminous coal. The Hannibal hewer has 13 chisel-type bits rigidly mounted on the blade holder, which is vibrated by an eccentric air motor. The pounding force is said to be 400 tons. The other, the Flottmann hewer, which in the opinion of the Germans offers greater promise, has four chisel bits in place of the rigid blade. Each bit constitutes the blade of a separately-mounted pneumatic hammer.

Two of the principal items included with the accessory equipment are the hoists for pulling the planer back and forth along the longwall face. Standard car hoists were used and the speed of the planer was between 20 and 40 f.p.m. Six-strand wire rope, ¾ to 1⅛ in. in diameter, is used and rope pulls up to 10 tons per rope have been reported. The main sheaves, located at the ends of the longwall face, are either in movable blocks mounted on I-beam frames or steel-box frames resting on the floor in specially prepared stalls.

The face conveyor consists of a chain conveyor heavy enough to withstand the wear and stress of holding the planer against the coal and to stand the blows from falling coal. The 7- to 8-ft. pan sections are loosely connected to permit turning through a 5-deg. angle. The speed of the conveyor is approximately 200 f.p.m. and it will move as much as 300 tons per hour. The conveyor is powered by two 40-hp. electric motors, one at each end, and also by a 30-hp. air motor at the discharge end for starting under heavy loads and for making slow-speed routine checks of the conveyor chain. A Voith-Sinclair oil transmission in the mechanical drive circuit for the electrical drive at the discharge end helps to synchronize the two electric drives. This feature, plus 120-percent automatic-overload time-relay protection, has reduced the number of mechanical breakdowns. Conveyor breakdowns, at the Ibbenbüren mine, were responsible for more than 50 percent of the 1½-hour loss of loading time per shift reported for each unit as a result of mechanical troubles.

For moving the conveyor and holding the planer against the coal, pneumatic cylinders, or rams, spaced 13 to 16½ ft. apart, are employed. These rams are designed to retract automatically if the planer needs relief. Another form of conveyor moving device used in the Friedrich-Heinrich mine is the back-sled, or wedged-shaped skid, which is dragged along by the planer between the conveyor and the face row of props. This moves the conveyor sideways but does not provide for applying pressure against the planer.

The coal planer to be used in the anthracite experiment will have pneumatic hammers like the Flottmann hewer and a front end similar to that used on the solid-blade Ibbenbüren planer. Only half of the planer will be assembled and, therefore, cutting will take place in only one direction. The planer is to be tried in flat, retreating semi-longwall work. The layout of the 300-ft. face will be similar to that used at the Friedrich-Heinrich mine (Fig. 3) where the advancing longwall system was employed.

Waste Filling by Air

The fourth item scheduled for study in the anthracite region is waste filling with a pneumatic packing machine. This air-driven unit, also German, will pack minus 3-in. material at a rate of 30 to 35 cu.yd. per hour. A 6-in.-diameter 500-ft.-long discharge line will be used.

Hydraulic flushing of gangways and chambers has been employed in the anthracite region with varying degrees of success. With this method, it is sometimes difficult to do a good job and it requires that the water be drained off and pumped from the mine. It is hoped that pneumatic packing will enable collieries to pack old workings solid, thereby minimizing or controlling subsidence so important in the populated areas.

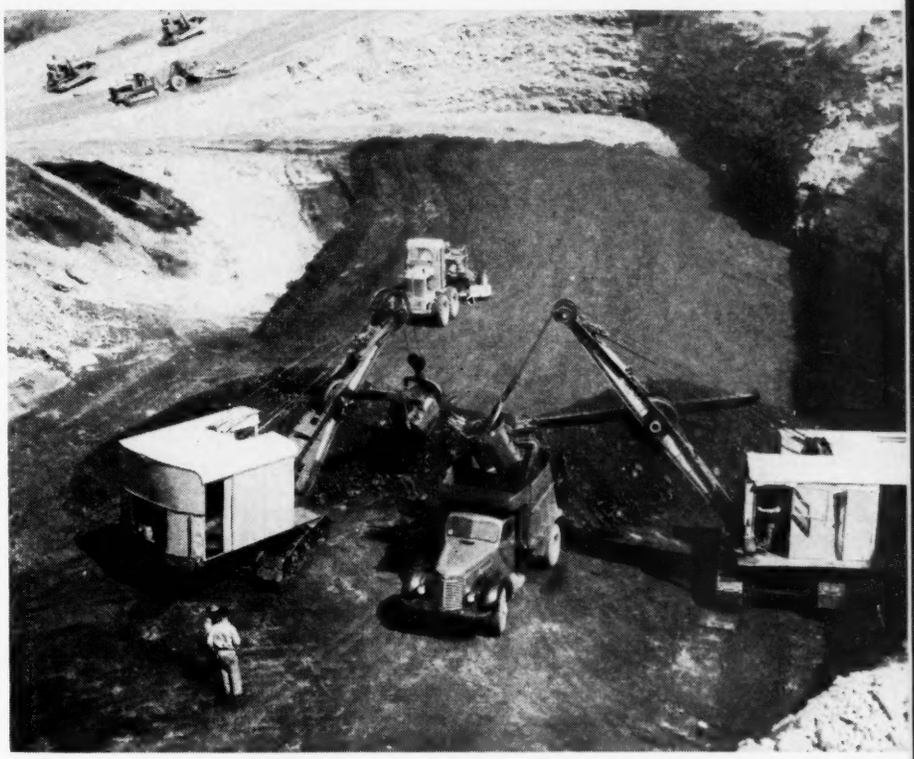
SCRAPER STRIPPING

Provides Flexibility With High Tonnage

Four Scrapers and Four Bulldozers Average 1,000 Cu.Yd. per Hour—Pushing Scrapers Permits Operation in Third Gear—Wide First Cut Boosts Coal Quality—Shooting and Trenching Speed Stripping Work

CRAWLER-MOUNTED tractors, rubber-tired scrapers and bulldozers are moving overburden at a rate of 1,000 cu.yd. per hour at George H. Yoxtheimer's stripping three miles northeast of Punxsutawney, Jefferson County, Pa. Starting at the crop line, overburden is removed in successive cuts up to 90 ft. wide until cover reaches a depth of 62 ft. In the loading pit two 1¼-cu.yd. shovels load into the same truck, thus cutting the loading time for each truck by half. Much of this equipment, prior to the war, was used in highway-construction work.

This operation is on a 1,300-acre tract on which a 60-in. seam (Lower Freeport or "D" vein) had been deep mined. The upper Freeport, or "E" vein, (3 to 4 ft. thick), some 35 to 45 ft. above the previously mined seam, is the one now being stripped. About 15 miles of crop line is involved in this hill-top stripping project. Overburden, from the top down, usually consists of 12 ft. of clay and subsoil and a vein of sandstone varying from 6 in. to 3 ft., followed by a layer of "buckwheat" shale extending to the 10-in. layer of tough bony coal immediately over the "E" vein.



Two 1¼-yd. shovels load each truck in the pit.

A bulldozer pushes the tractor-scraper unit while the scraper is being loaded, permitting the units to operate in third gear. About 40 to 50 percent more work is thus accomplished.

First Cut: 90 to 170 Ft.

The procedure followed in removing the overburden for the first 90 to 170-ft. cut next to the crop line is to load and haul it out over a route at right angles to the general line of advance of the pit. Eight Type HD-14 two-cycle Allis-Chalmers track-type tractors, four with Baker blades for operation as bulldozers, and four 15-yd. four-wheeled Gar Wood scrapers with cable controls (hydraulic controls previously employed and shown in the illustrations replaced with the cable type) load and move the overburden. The arrangement is to have a tractor pull the scraper and a bulldozer push from behind. "By using the pusher technique," explains Mr. Yoxtheimer, "we can keep our loading, hauling and

Four tractor-scraper-bulldozer units move overburden at a rate of 1,000 cu.yd. per hour, eleven hours a day. The loading shovels and trucks operate nine hours a day.

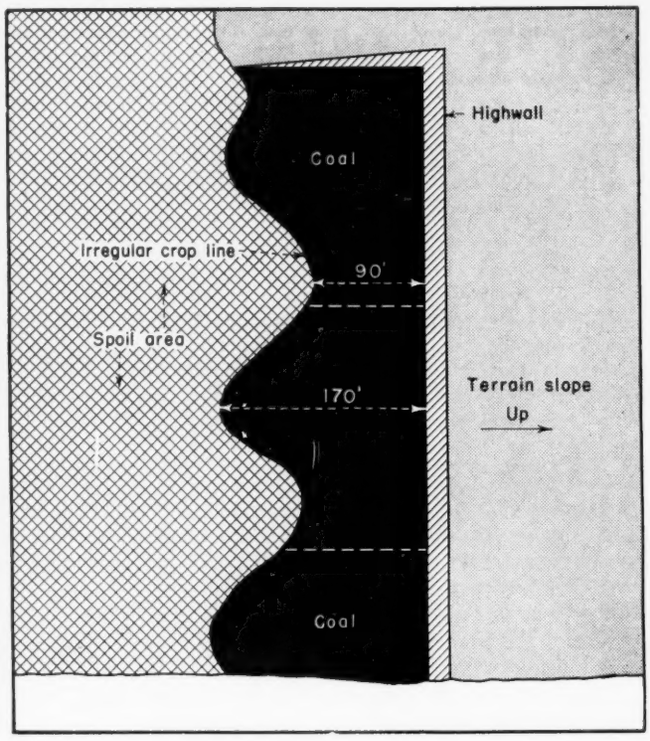


Fig. 1. The highwall is kept straight regardless of variations in the crop line. A 90-ft. strip of coal is needed for "abreast operation" of the two loading shovels.

dumping time down to a maximum of three minutes for a round trip." A pushing bulldozer permits loading and hauling to be done in third gear. Running in third gear, each tractor uses about 75 gal. of fuel oil during an 11-hour day or an average of 1 gal. per cylinder per hour. Where the Baker blades of the bulldozers bear against the Gar Wood scrapers there is a patch plate to reinforce the blades.

The width of the initial cut varies from 90 to 170 ft., depending on the curvature of the crop line. However, the highwall line is kept as straight as possible. A minimum width of 90 ft. is necessary to accommodate the two loading shovels that load each truck simultaneously. After the bulldozer pushes its tractor-scraper unit down the hill it goes back and comes down again with its own blade full of dirt and deposits it just off the crop line. Meanwhile, the tractor scraper unit circles beyond the crop line and disposes of its load. Four scrapers and four bulldozers remove overburden at a rate of 1,000 cu.yd. per hour.

The hillside cover is removed in sections 130 to 200 ft. long with the depth of the highwall at the back of the first cut 25 to 35 ft. The haul is 200 ft. or less, measured from the foot of the hill. This method of disposing of overburden at a turn, Mr. Yoxtheimer points out, has an advantage over the conventional stripping equipment with its casting limitations, especially when the highwall line has to be swung 90 deg. or more. In some instances, a strip shovel might be obliged to leave a pocket of coal possibly as in Fig. 2, because of lack of space to pile the overburden. With tractor-scraper units explains Mr. Yoxtheimer, they can swing out at a sharper angle and deposit their loads a little farther out, as shown in Fig. 2. In the end, the overburden is well distributed and there is no fault to be found with the way it is finally left.

Once the overburden has been removed down to the layer of bony coal next to the "E" vein, two Model AD Allis-Chalmers motor graders, equipped with 75- hp. two-cycle diesel engines,

The bulldozers help with the loading of the scrapers and between trips do overburden moving on their own.

go into action. Each of the 11-ton graders is equipped with scarifiers (three angled teeth) which rip the bony coal off the clean seam. The graders then clear away the bony coal with the moldboard blades, leaving only clean coal for the loading shovels to pick up.

Two Shovels Load Each Truck

Loading a truck with two shovels working together is unusual in stripping but Mr. Yoxtheimer planned it that way so that trucks would not have to wait at the shovels—both Lorain 75 B units. The coal is loaded with or without shooting, depending upon conditions. Production averages 950 to 1,250 tons per day. Stripping with scrapers has the further advantage that a wide first cut can be taken so that the inside shovel is in top-quality coal, thus eliminating the "coal rejections" common with usual first-cut coal.

Shooting normally is necessary in removing the second cut, which usually is 75 to 90 ft. wide. Both level and angle holes are employed. The 6-in. level holes are drilled first to a depth of 80 to 90 ft. Their primary purpose is to shatter the rock. Angle holes are slanted up so that they are 10 to 20 ft. higher at the back. These holes are put in to knock down the previous highwall and also to move as much dirt as possible into the pit of the first cut. Holes are spaced 12 to 25 ft. apart and are loaded with 200 to 500 lb. of dynamite, depending upon the structure of the overburden.

Actual stripping of the second cut is prefaced by cutting a trench, or keyway along the location of the new highwall, as shown in Fig. 3. The trench, which is made by a scraper and is never more than 24 in. deep, permits the bulldozers to get back of the dirt and roll it down into the spoil area, aiding scraper operation to

It is no problem to distribute overburden once loaded in this rubber-tired scraper.

that extent in handling the material.

The maneuverability of highway dirt-moving equipment as applied to this stripping was demonstrated on one occasion last winter when 4,000 ft. of track of an electric railroad, on the crop line of another tract of "D"-vein coal, was relocated. Moving the track and roadbed some 500 ft., along with 35,000 cu.yd. of excavation, was handled by eight HD-14 tractors with Baker blades, and 100,000 tons of coal was recovered. The HD's are rated at 132-drawbar-horsepower with a top speed of 7 m.p.h.

The importance of good roads is recognized at the Yoxtheimer stripping. The motor graders, already mentioned in connection with the work of ripping away the bony coal, patrol the roads much of the time. A one-way haulage circuit is maintained wherever

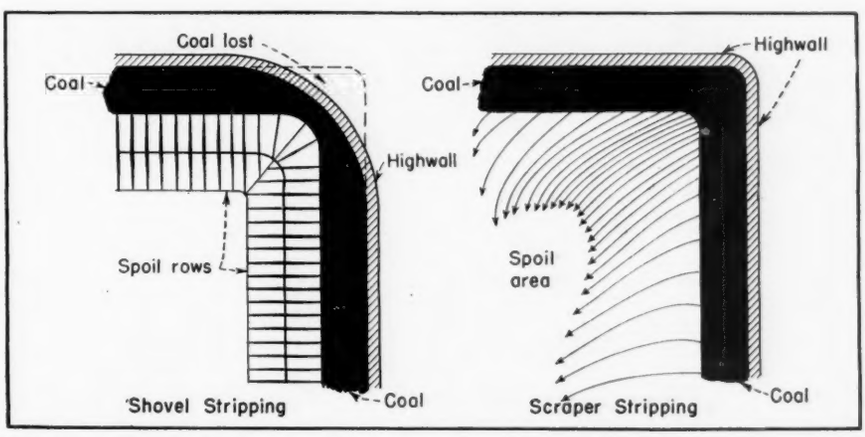


Fig. 2. Lacking spoil area on a sharp turn, a shovel is sometimes obliged to leave coal. Tractor-scraper units swing out at a sharper angle and deposit their loads farther out.

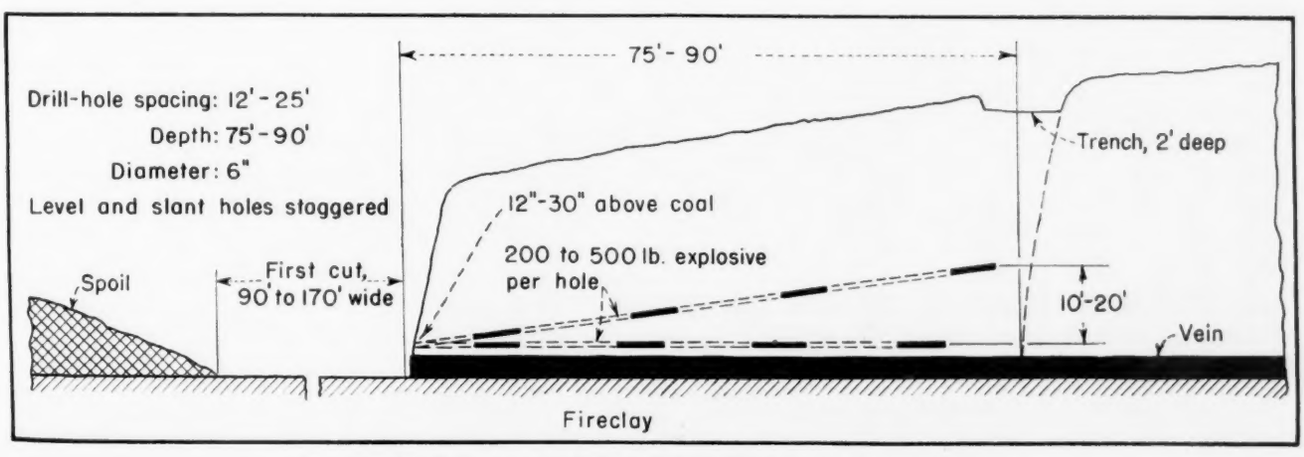


Fig. 3. Shooting plan for blasting the overburden on the second pass.

General view of most of the equipment in service at the Yoxtheimer stripping.

Two motor graders patrol the one-way haulage circuit to and from the pit.

Geo. H. Yoxtheimer (right) and J. J. Moyer Jr.

possible. Approximately five miles of roads are topped with "red dog" or ashes from deep-mine refuse. This material is rolled and packed by a 10-ton Buffalo-Springfield roller. The coal is trucked from the pit in 9- to 10-ton loads in International, White and Diamond-T trucks, all with gasoline engines.

Machines Checked, Cleaned Daily

Preventive maintenance is practiced, with virtually every man on the job having a part. Each night, the machines are cleaned with pressure hoses and turned over to a three-man maintenance crew for inspection and servicing. The tractor-scraper-bulldozer units work 11 hours a day to keep ahead of the loading shovels and coal trucks, which work nine hours. With every piece of equipment in steady service any major delays are immediately reflected in lower production figures. Here is where Mr. Yoxtheimer's enthusiasm for aviation pays dividends. He owns an army PT-19 and a 1946 four-place Stinson. He flew the latter to Harrisburg recently, procured a cylinder head for an HD-14 and got the tractor back in service in less than five hours.

The office, repair-parts building, service shed and repair shed are each mounted on skids and are kept within ¼ mile of the pit. The tractors return to the service shed at noon each day for refueling and a quick inspection. The repair shed is long enough to accommodate a tractor-scraper unit with the doors closed. The 35 men employed on this operation are under the supervision of J. J. Moyer Jr., superintendent.

COAL SCREENING

And Dewatering With Vibrating Units

Application to Coarse-Coal and Run-of-Mine Screening—Considerations Affecting Blinding With Small Sizes and How Blinding Can Be Reduced—Factors Involved in Dewatering Coal With Vibrators

By J. E. DUNN
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UNTIL a few years ago all run-of-mine screening was done on shakers. The shaker screen will continue to be popular for this service. This is not only because it makes a satisfactory separation with the coarser openings, such as 2-in. and larger, but, more important, its design is ideal for conveying and lends itself to use for picking. In other words, in addition to possible picking applications, the shaker conveys the lump coal from the point of entry into the tipple to loading booms or crushers as desired.

However, in some preparation plants built in the past two years or so, heavy-duty single-, double- and triple-deck vibrating screens of two- and four-bearing design have been used very satisfactorily for run-of-mine coal. The advantages of a vibrating screen in comparison to a shaker are:

1. Availability in single-, double- and triple-deck designs to make two, three or four separations.

2. Multiple-deck screens can be built with decks on different slopes, depending upon the size of the coal, separation, etc. These are called screens with vari-sloped decks.

3. Less head room. Large tonnages can be handled on a small, compact vibrating screen with a saving in space.

4. Less vibration transmitted to the tipple.

5. Less power and lower maintenance.

The disadvantage in using a vibrating screen rather than a shaker is that conveyors must be used for picking and conveying the larger sizes to the

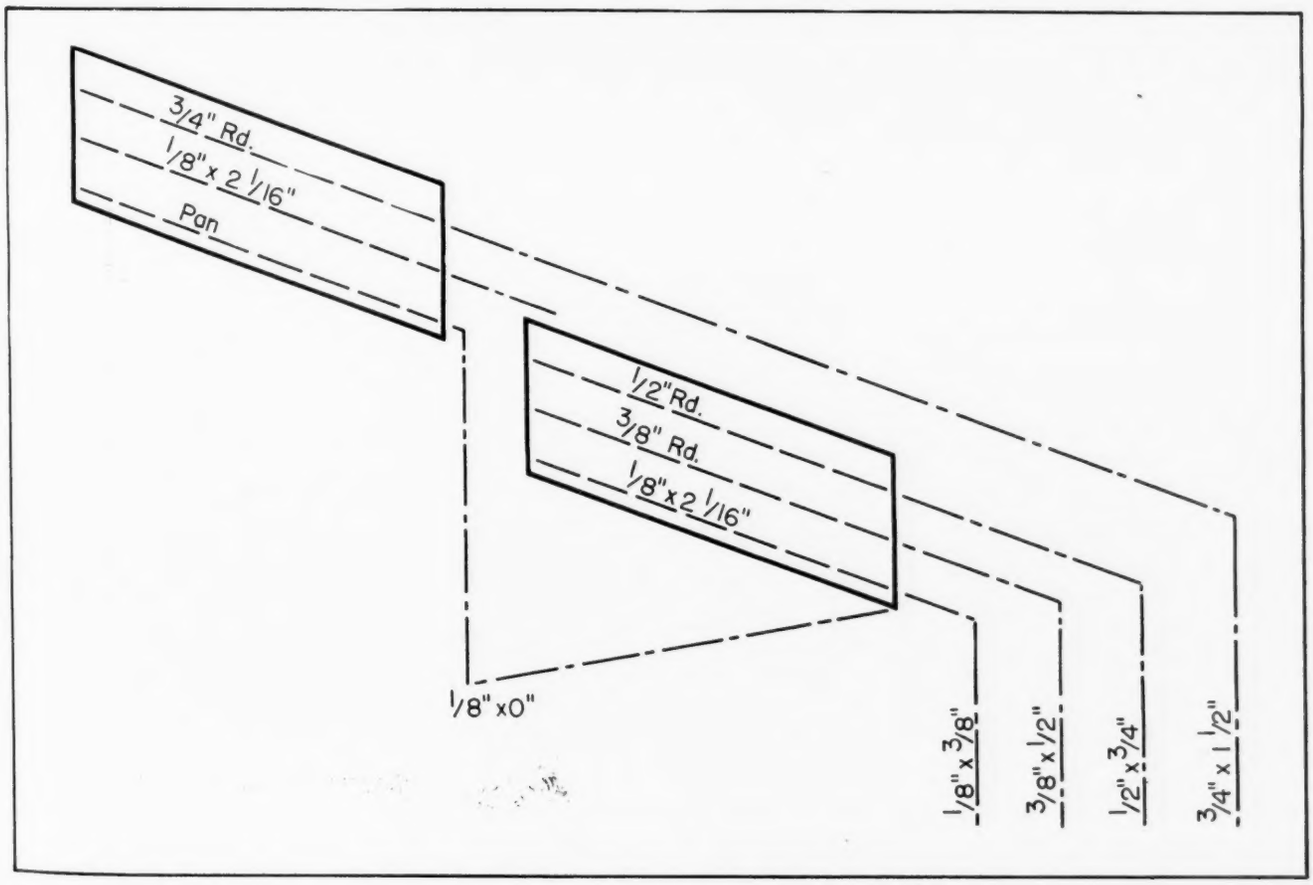


Fig. 1—**Five-product separation from 4-percent-surface-moisture screenings using two triple-deck vibrating screens. Removing large percentage of ⅛x0 on top deck reduces blinding tendency.**

crushers or booms for further handling.

The demand for vibrating screens with vari-sloped decks for use ahead of washers to remove ¼x0 in., or 4 mesh, has increased as a result of the use of revolving or trommel-type breakers for run-of-mine coal. For handling large coal, such as 10x0- or 8x0-in., it is necessary to select vibrating screens with the decks on the proper slopes to reduce the rate of travel of the coal over the deck and thus reduce degradation to a minimum.

Experience has shown that maximum tonnage is obtained when screening on a ¼-in., or 4-mesh, opening when the screen deck is installed at a 25- to 27-deg. slope and driven counterflow. Obviously, 10x0- or 8x0-in. coal cannot be handled on ¼-in., or 4-mesh, opening, and therefore it is necessary to resort to a multiple-deck screen to relieve the load on the bottom deck. Experience also has shown that coal as large as 10- or 8-in. should not be handled on a screen on a slope of 25 deg. since excessive degradation will occur because of the high velocity of the large lumps passing over the deck.

For handling 10- or 8-in. coal, screens have been developed with vari-sloped decks. Coal 6x0- and 5x0-in. can be handled on a 25-deg. slope, provided there is some means to retard the flow of the coal on the top deck, such as baffles and the like. For some installations, especially when handling 5x0- or 6x0-in. soft-structure coal, a screen with a special top deck is available to combine the oversize from the top deck with the oversize from the second deck, thus permitting the use of single chutes to the washer or cone. This arrangement results in reduced degradation.

Screening High-Moisture Coals

There is a difference of opinion, especially in some districts, regarding the use of mechanical or electrical screens for screening ¼x0 or $\frac{5}{16}$x0 high-moisture coals with $\frac{5}{16}$x2$\frac{5}{16}$-in. openings. While some operators are handling such sizes with 7- to 8-percent surface moisture on electrical screens, it is necessary to brush the screens frequently and operate at reduced tonnage. Operation of these screens can be improved if the size of the feed is increased to 1½ in. so that the scouring action of the larger coal will assist in eliminating blinding. Objections to the electrical screen are its maintenance expense and low capacity. Because of its inherent design, it is built in the smaller sizes, thereby making necessary a large number of screens for the output of a large tipple. Several electrical screens have been replaced with inclined screens operated at 25 to 27 deg. to horizontal in one district and several electrical screens have been replaced with horizontal screens equipped with a ball-type deck. Smallest opening used on this type of screen is about ⅛ in. rectangular. A preparation plant in the East has made plans to replace 20 4x8-ft. electrical screens with the same number of 5x8-ft. mechanical screens to reduce operating costs, increase the capacity of the tipple and obtain better screening.

Scouring Cuts Blinding

The scouring action resulting from the presence of large coal in the feed eliminates blinding on the smaller meshes. Consequently, it is advisable to remove the maximum percentage of fines while the coarse coal is in the feed.

Assuming that two 6x14-ft. triple-deck screens were used in series to handle 175 t.p.h. of 1½x0-in. coal carrying about 4-percent surface moisture and it is desired to make five products, namely ¾x1½-, ½x¾-, ⅜x½-, ⅛x⅜- and ⅛x0-in., an ideal arrangement of the screens would be as shown in Fig. 1. Using this arrangement, the top screen would remove a large quantity of the ⅛x0-in. Consequently, the tendency to blinding on the ½-, ⅜- and ⅛-in. decks of the lower screen would be reduced even though the maximum-size feed on the ⅜-in. deck is approximately ½ in. and on the ⅛-in. deck, ⅜ in. If the ⅛x0-in. is not removed on the upper screen as indicated, blinding could be expected on the bottom deck of the lower screen because of the increased quantity of fines and the absence of the larger particles to scour the screen surface.

In cooperation with the tipple manufacturers, single-deck screens with shallow bodies are available to reduce headroom approximately 1 ft. 9 in. for each bank of screens. This results in considerable saving in steelwork, shorter conveyors, elevators, etc.

At the present time, shaker screens are being used for dewatering the large fractions, such as 5x2-in. coal, and they perform a satisfactory job because of the reduced surface area of large coal. The shaker screen lends itself to this application because it also acts as a conveyor to carry the coal to the loading boom or crusher.

The dewatering of smaller size coal, such as ¾-in.x1 mm, ½-in.x½ mm, etc., is a more difficult job because of the conditions encountered, such as surface tension, increased surface area, etc. To dewater a smaller size efficiently, a horizontal vibrating screen is recommended; while for dewatering medium-sized coal, such as 2x½-in., a horizontal screen with a conventional single- or double-crown deck, together with drip strips, is recommended.

To obtain efficient dewatering, experience has shown that the rate of travel of coal over a horizontal screen should be approximately 40 to 50 f.p.m.; also, that increased amplitude is desired, namely $\frac{7}{16}$ to ½ in., to raise the coal sufficiently above the deck to release the surface tension.

The question of using a circle-throw inclined-type screen in a horizontal position as compared to a horizontal screen with a straight-line motion has generated some debate. In dewatering service, however, it is obvious that for maximum efficiency the following factors must be considered:

1. The time the coal is on the screen.
2. Depth of bed on the screen.
3. Operating cost.

The circle-throw screen is designed to utilize gravity plus a slight conveying action derived from the amplitude to move the material over the screen at the proper rate and effect proper stratification. When a circle-throw screen is used in a horizontal position for dewatering purposes, a definite conveying action is not obtained and it is necessary to depend upon the coal entering the screen for assistance in getting forward movement.

It has been found, as a result of field tests, that coarse coal, such as ¾x⅜-, or ¾x¼-in., conveys over a circle-throw machine considerably better than the smaller sizes, such as ¼x0-in. Therefore, before an inclined-type screen is selected for horizontal operation, it is important to consider the size of the feed and limit the length of the screen to about 10 ft. unless the screen is installed on a slope of 5 to 7½ deg.

Horizontal-Screen Applications

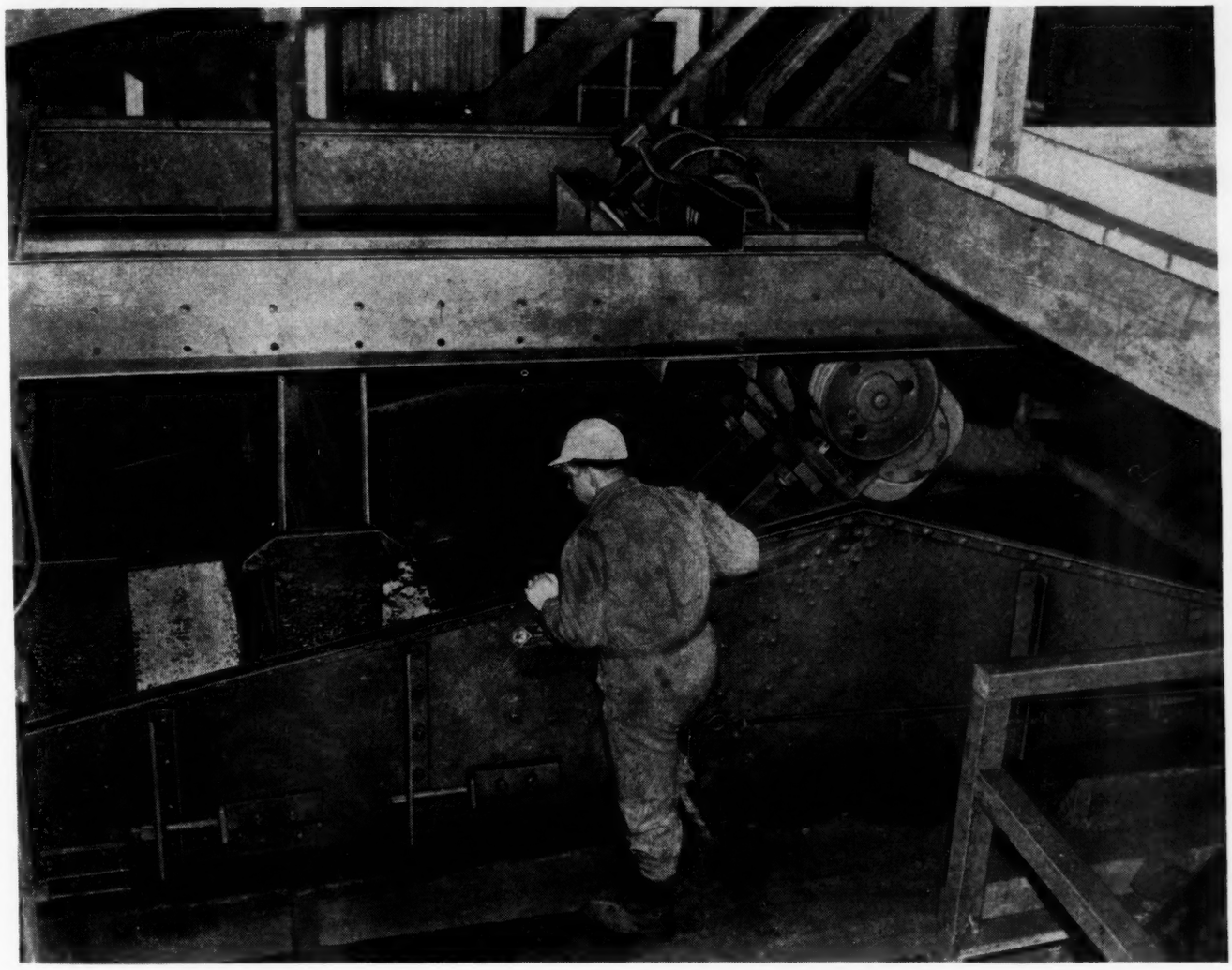
General applications of horizontal screens are:

Dry screening—openings as large as 2½ or 3 in. and as small as ½ in., unless rectangular-opening wire cloth is used.

Wet screening—openings as large as 2½ or 3 in. following washers for primary and secondary dewatering purposes down to ½ mm.

A typical example of the use of vibrating screens in a washing plant is shown in an accompanying illustration.

Experience has shown that if stationary wedge-wire screens are used in chutes ahead of the screen to remove a part of the water, the life of the



New deck tensions screen surface longitudinally instead of horizontally, providing the advantage of uniform bed thickness across the entire screen width. End tensioning makes increased dewatering efficiency possible.

screen surface on a vibrating screen can be increased considerably. In one installation, for example, a 5x14-ft. screen was installed to handle about 40 t.p.h. of fine coal flumed onto the screen with about 2,000 g.p.m. of water. Life of the screen surface was about 90 days. Later, dewatering cones were installed ahead of the screen and the quantity of water reduced to about 500 g.p.m. Life of the screen surface was increased to a minimum of six months and an average of one year of service.

The action of a horizontal screen, whether of the straight-line or circle-throw type, stratifies the bed of coal with the small particles on the bottom and the coarser on top. This is ideal for screening but contrary to what is desired for efficient dewatering. The installation of several dams across the screen surface to turn the coal over, putting the coarse particles on the bottom and the fines on top, results in better drainage and naturally efficient dewatering.

There has been considerable activity in the screening of sludge in the past two years or so. For example, the screening of minus 10-mesh sludge using 28- to 35-mesh cloth is no longer considered a difficult problem. In this service, a 5x14-ft. low-head screen with end-tension deck can handle about 40 tons per hour.

Wire Cloth Recommendations

In selecting wire cloth, it is recommended that rectangular-weave stainless-steel cloth be used in all cases where moist coal is handled. For screening reasonably dry or moist coal with openings of $\frac{5}{16}$ in. or larger, regular square-mesh cloth of spring or regular steel is satisfactory.

The question of whether to install a two-bearing inclined-type vibrating screen with a balanced mechanism or a four-bearing balanced screen also merits some discussion. Until about six years ago, the four-bearing screen was not built in the larger sizes, such as 5x12, 5x14, 6x12, 6x14 and 6x16 ft. The two-bearing screen is now used for run-of-mine coal with openings up to 6 in. round. In fact, some applications have been made with 8-in. square openings.

The drive of the two-bearing screen runs as true as that of the four-bearing type and it does a screening job as good or better. Two-bearing construction provides a heavy duty screen without extras such as support-frame and outer bearings—all resulting in smoother operation with reduced initial cost and lower maintenance in the operation of preparation plants.

Considerable laboratory research work has been done to separate slate, bone and foreign material from the coal using magnetite as a media. Information is now available to tipple manufacturers and coal companies regarding the size of screens required for pre-sizing and pre-wetting the coal ahead of separatory vessels or cone, area required for draining the media from the coal and refuse and area required for dewatering the coal and refuse for loading in cars or handling on a belt.

First loader-shuttle car unit at work in a pillar section in Washington mine.

PRODUCTIVITY LIFTED

By Shuttle Cars and New Mining Method

Tons per Man Doubled by Change to Shuttle-Car-Loader Mining Supplemented by Retreat Operation—Big Pillars Mined by Open-Ending—Deep Cuts Shot With Permissible and Carbon-Dioxide

A CHANGE in mining plan and equipment has more than doubled tons per man to the mine car at the Washington mine of the Clayton Coal Co., Erie, Colo., in the Denver basin. Washington mine was opened in 1940 (May, 1941 *Coal Age*) and recovers the Laramie-formation coal. Average mining height in the area where the new equipment is employed is 8 ft. Some 2 ft. above a natural parting is left to protect the roof, which, immediately over the coal, is 18 to 24 in. of blue slate followed by about 40 ft. of very sandy rock. The latter breaks easily, which is an advantage in pillar mining. Some 6 in. of coal also is left in the bottom to provide a harder roadway for the equipment. Under it is an average of 8 in. of soft soapstone that carries some water and tends to swell and disintegrate when exposed. Cover over the new work is 450 ft. and the seam dips 1½ to 2 percent southeast.

Work at Washington mine generally is based on driving out to the boundary and working back. The territory where the new equipment is employed, therefore, is about one mile north of the shaft on the boundary line (Fig. 1). New territory is being developed to the east for an additional unit. This unit is similar to the original, which includes a 11 BU loader, two Joy 6-ton shuttle cars powered by 300-amp.-hr. Exide-Ironclad batteries, battery-charging station, Sullivan 7-B shortwall with 9-ft. bar (regular bits), Jeffrey crawler-type shortwall truck, Chicago Pneumatic hand-held drill with twisted auger and Coalmaster bits, Joy elevating conveyor and tubing blowers as necessary. For the haul to the shaft bottom, the coal is transferred into 2½-ton Card steel cars, which are handled by a trolley locomotive. Cars are blocked past the elevator, which is placed so that there is sufficient grade one way or the other.

This first unit went into operation in July, 1945. A standard crew consists of 15 men—loader operator and helper, machine runner and two helpers, bugduster, driller and helper, tim-

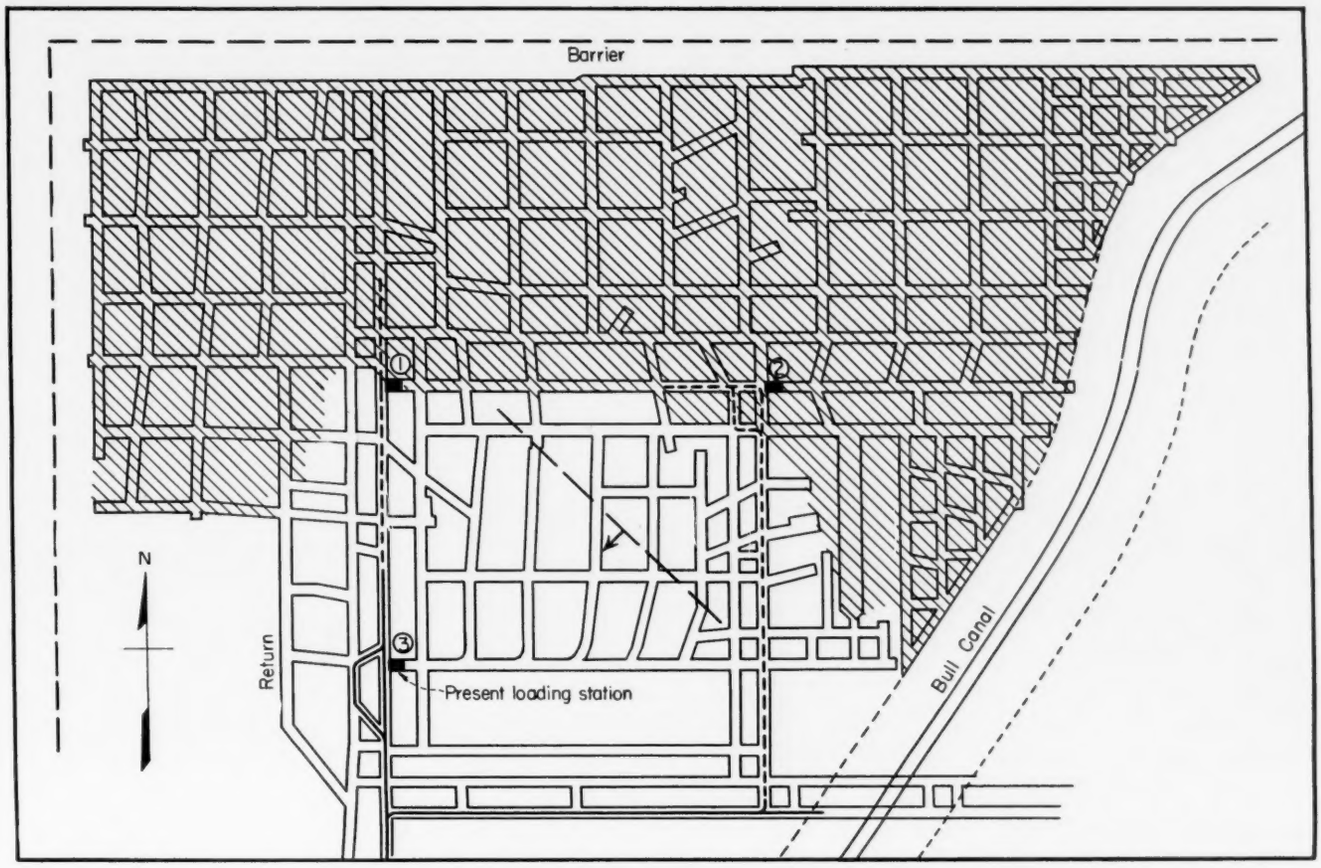


Fig. 1—Initial shuttle-car work at Washington mine showing evolution in pillar size as well as locations of the various loading stations. Length of pillars is expected to be doubled in future work.

berman and helper, two shuttle-car drivers, ramp man, sprinkler and foreman.

The unit works on a two-shift schedule in the new block-system territory shown in Fig. 1. This territory was worked from three loading stations, as indicated, No. 3 being the last to the time this article was prepared. Pillaring started in the point to the northeast and first was based on cutting the coal up into small blocks. Recovering them, however, involved too many small stumps and a change was made to a large block, made by driving rooms and crosscuts 10 ft. wide and taking off corners to permit the shuttle cars to get around. In view of the nature of the top, however, it was decided to eliminate some of the wide openings at junctions by reducing the number of crosscuts, made possible by driving with blowers and tubing. With the rooms on 100-ft. centers, this resulted in rectangular pillars 90 ft. wide and a little more than twice that in length for subsequent recovery in the pillaring operation.

Pillaring is done on a 45-deg. line and individual pillars are mined by open-ending them. Width of the open ends is approximately 40 ft., this width being preferred because in the opinion of mine officials, it results in

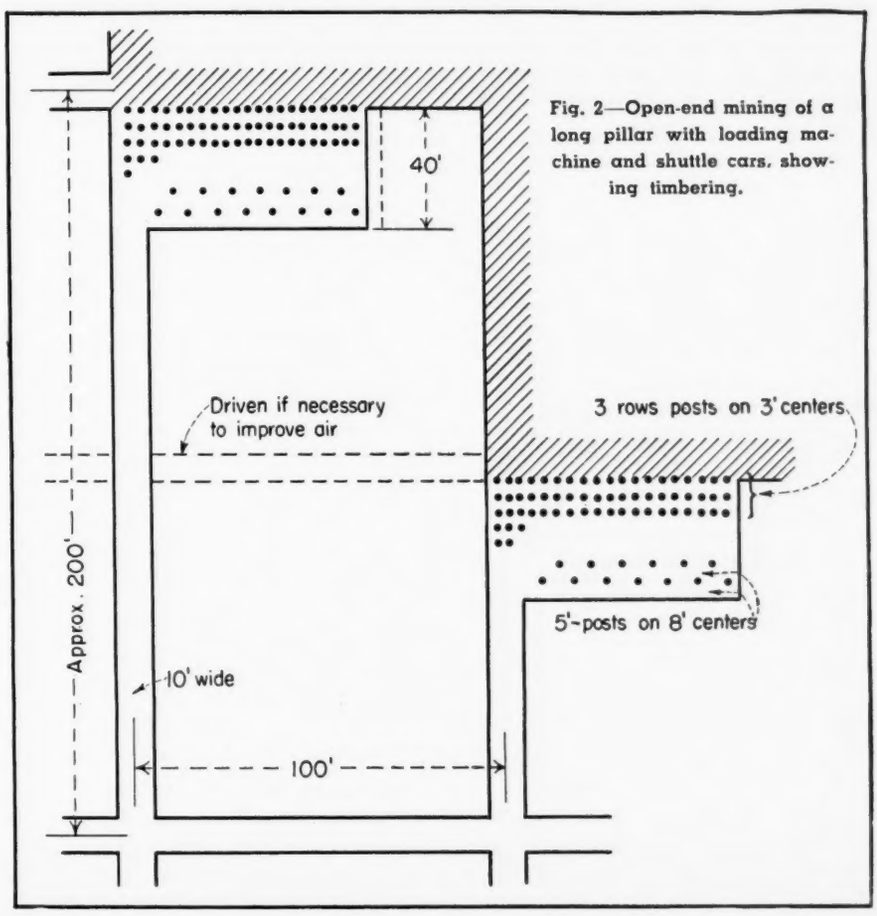


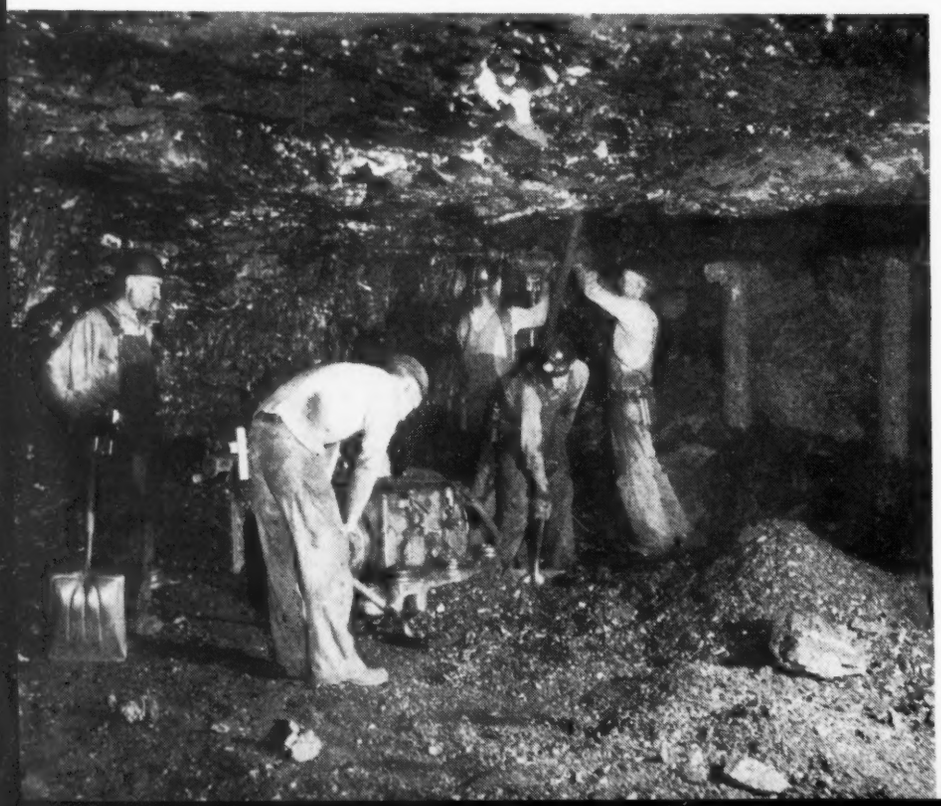
Fig. 2—Open-end mining of a long pillar with loading machine and shuttle cars, showing timbering.

Loader completing removal of a stump. Note cave in the background. New work, however, will be primarily open-end.

Loaded shuttle car ready for the run to the transfer station where the coal is run over an elevator into mine cars.

Transfer and car-loading station at Washington mine.

Cutting and drilling in pillar work using a shortwall and hand-held drill.



less roof trouble and provides more room in which to work. To protect the haulage road and the open-end place, three rows of breaker posts are set as indicated in Fig. 2. Props in these rows are on 3 ft. centers. Additional posts are set in the room and the open-end place on 8 ft. centers in rows 5 ft. apart as required, leaving a 12-ft.-wide roadway for the shuttle cars. Normally, the gob end of the cut is cleaned up first and is followed immediately by breaker posts. When an open-end lift is completed, the roof is caved while the machine drops back to repeat the operation. Normally, the first cave includes all the 40 ft. of sandy rock. Then, after a considerable area is worked, the caves start to go on up, although none, as yet, has reached the surface.

Two Coal-Breaking Mediums

Coal is broken down at Washington mine with both permissible and Cardox. The latter, because it tends to peel the top coal down, is limited to the bottom holes, three in number, which are drilled about 3 ft. above the undercut. The center one of the three holes is dipped down to enable the breaking medium to kick the center out, relieve the top holes—also three in number—and make it easier for the loader to work into the fall. Power for all underground work is supplied by a new 300-kw. General Electric rectifier. A pipe-line system throughout the working section supplies water for sprinkling. The Clayton Coal Co., which also operates the Morrison and Clayton mines in the same field, is headed by H. B. Crandell, with headquarters in Denver. Mine officials include John Sidle, general superintendent; Earl Otava, day foreman; Steve Bokan, assistant day foreman; T. W. Miller, night foreman; and William Gregory, assistant night foreman.

PORTAL RELOCATION

Paces Mining Improvements at Hubbard

New Shaft and Change House More Convenient for Men, Promotes Safety, Aids Ventilation and Cuts Travel Time—Aluminum Crossbars Used at the Face—Aluminum Cable Replaces the Copper Type

The new portal and washhouse at Hubbard mine are 4½ miles from the old shaft.

ALUMINUM CROSSBARS, aluminum cable, a new shaft portal and new bath and change facilities are among the latest steps in the improvement program being carried out at the Hubbard mine of the Greensburg-Connellsville Coal & Coke Co., McKeesport, Alleghany County, Pa. Travel time is reduced 1¾ hours by the new man-and-material shaft, while the bath and change house greatly increases the comfort of the men. Underground, acid-resistant aluminum H-beams are used both at the face and in the main heading. Bare all-aluminum stranded cable, with a conductivity equivalent to 500,000-cir. mil copper but weighing only 74.6 lb. per 100 ft., is used for underground feeders on both sides of the 275-volt d.c. system and also in the negative circuit in the drillhole.

Both loading machines and duckbills are employed at Hubbard mine. Loaders are as follows: two Jeffery L-600, two Jeffrey L-400, one Joy 14 BU and three Joy 8 BU. Two are kept as spares. Cutting machines are: four Jeffrey 29 U universal, six Goodman 112 C and three Jeffrey 35 B shortwalls. A conveyor section is operated with six Goodman 12½ G duckbills and two Jeffrey 52 B belt conveyors. Both the Jeffrey A-7 and Chicago Pneumatic hand-held drills use 1⅞-in. Kennametal bits and augers. American Cyanamid 3A permissible in 1⅛ x 8-in. sticks, with Atlas caps with 9-ft. leads, are used in shooting. Gathering is handled by four Jeffrey 8-ton, two Goodman 6-ton and one General Electric 6-ton locomotives. Two 15-ton Westinghouse locomotives, with many modern features, take care of main-line haulage.

Construction of the new portal was decided on by the management after the haul had passed the 4½-mile mark, making it necessary for the men to spend two hours and 12 minutes of the nine-hour shift traveling to and from their working places. This also provided an opportunity for building a modern bath and change house—an opportunity already being sought by Charles B. Baton, president, and other company officials.

New Shaft Close to Face

The new shaft is approximately 4½ miles, according to the mine plan, from the original opening. With two compartments, the shaft is 24x12 ft. in dimensions and 280 ft. deep. It is concrete lined with a brick partition and was constructed by Appalachian

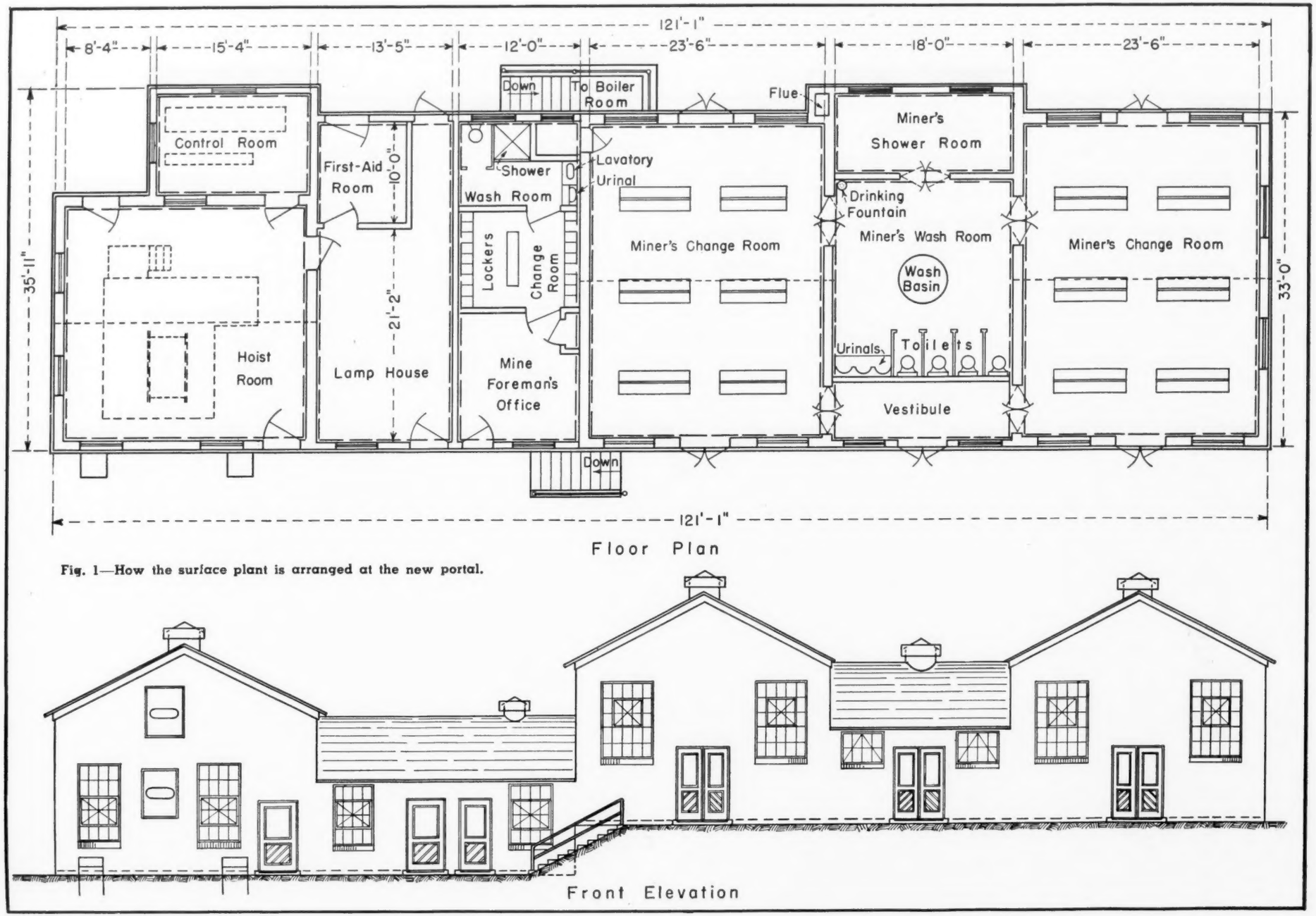


Fig. 1—How the surface plant is arranged at the new portal.

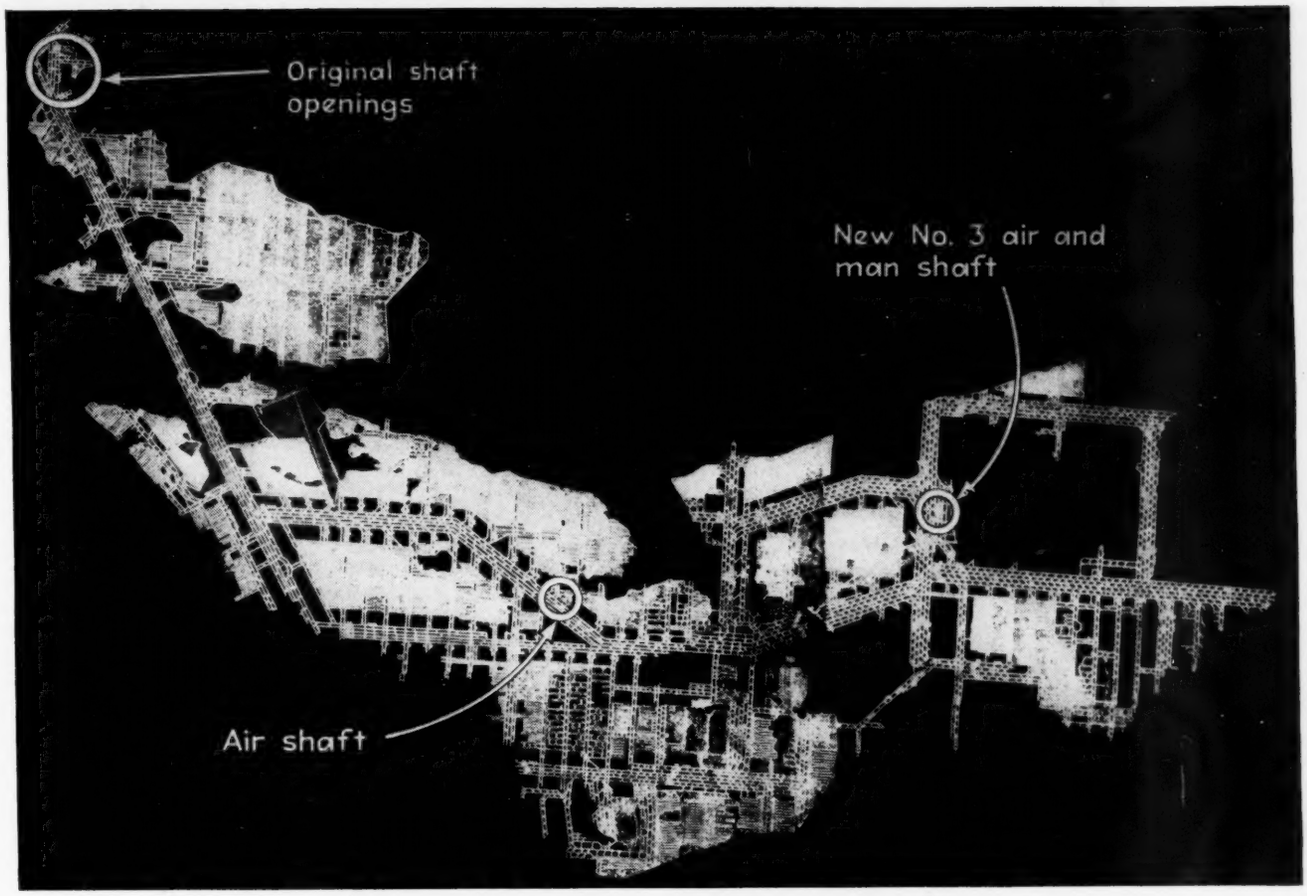


Fig. 2—The new portal at Hubbard mine is 4½ miles from the old shaft.

Contractors, Inc., Morgantown, W. Va. The headframe, erected by the Fort Pitt Bridge Co., Pittsburgh, Pa., is steel. One counterweighted cage is installed for men and materials. The new shaft was completed in May, 1946. Until that time the old shaft was used for men and materials as well as coal.

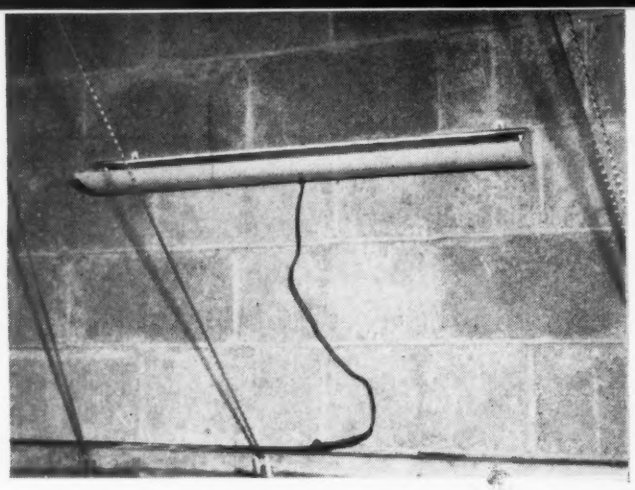
Ventilation Bill Cut

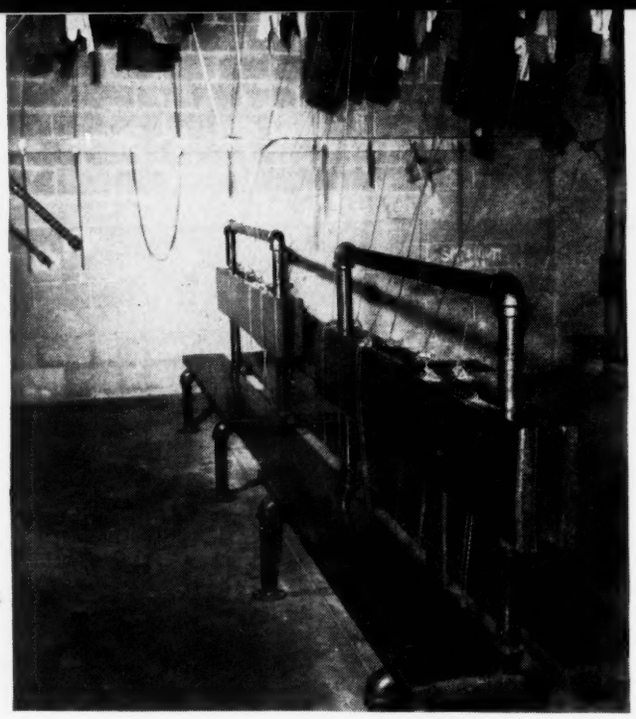
A Jeffrey Aerodyne fan was scheduled for early installation to exhaust air from the workings through the second compartment of the new shaft. At the time this was written, the old fan at the old shaft, driven by a 150-hp. motor, was ventilating the entire mine at a 5.5-in. water-gage. Under the new ventilation plan, two Aerodynes with 60- and 25-hp. motors will provide ventilation at a water-gage of 1.5 in. The horsepower on the air, under the new plan, will be 58 compared with 150 under the old.

The new shaft was installed as a safety measure, providing an escapeway from the center of the mine and improving ventilation. In addition, the new shaft solved the problem of long and ever-increasing travel time. Now, with nine miles of travel distance (4½ miles each way) eliminated, the men reach their working places in about 15 minutes and only 30 minutes of the shift is lost in travel time. This means, compared to the maximum of two hours and 12 minutes under the old system, that the men are spending about 1¾ hours more per shift in actual productive work. Of course, this marks the beginning of a new cycle in which travel time will gradually increase.

Since room was lacking at the old shaft, construction of the new portal provided the first real opportunity to build a bath and change house for the

How facilities for checking clothes look in the change room.

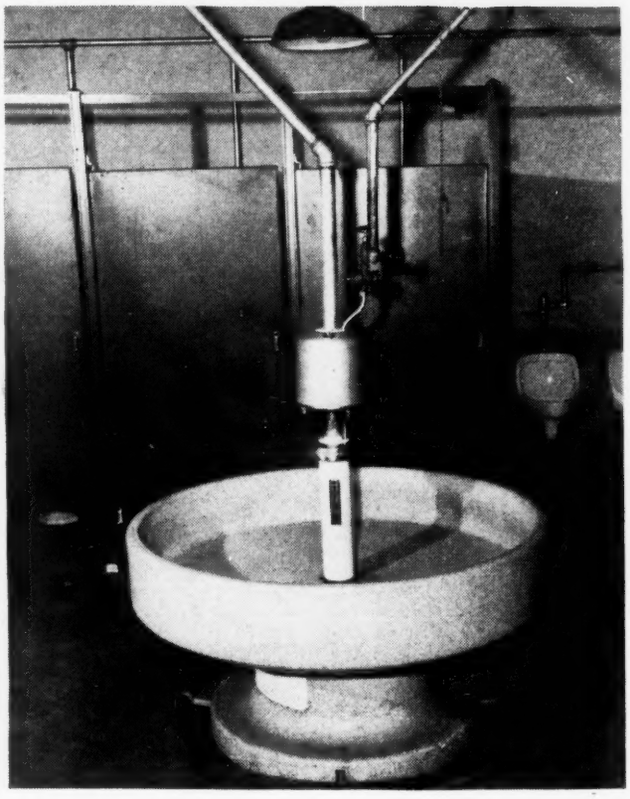




Four of these ultra-violet-ray lamps are mounted on the walls of each of the main change rooms.

Right—The washhouse benches are well built to act as anchors for the numerous chains.

Below, left—a mist-like spray from the dispenser in the doorway to the shower room prevents athlete's foot. Right—the washbasin is located between the two main change rooms.



convenience and comfort of the men. Having that opportunity, the company decided to do a real job, complete with reservoir and chlorination plant.

Bathing and changing facilities occupy the major part of a new five-section mine building, also including the lamp house, foreman's office and wash room, hoist room and control room. The whole is included in a concrete-block building 36 ft. wide and 121 ft. long. In one end are the two main change rooms, each 23½x32 ft., which accommodate 300 men. There is ample room since the mine is double-shifted and the men on both shifts use both rooms. The wash room, with Bradley wash fountain and toilet facilities, is between the change rooms. Entrance to a shower room is provided from the wash room.

Sanitation was a major point in planning the bath and change facilities. Four ultra-violet-ray lamps, for example, are mounted on the walls of each change room for killing germs floating in the air. A similar lamp is to be installed at each toilet in the wash room to keep the seat more sanitary.

Athlete's foot is the quiet intruder that haunts many wash houses. Hubbard, like many other mines, tried to eliminate it by providing 30x30-in. foot basins 3 in. deep at both entrances to the washroom. It was difficult to keep these basins clean, in addition to making them effective. When Peda-Spray equipment became available, Hubbard did away with the foot basins—filling them with concrete.

Peda-Spray was developed during the war and is accepted for use by the

The mine provides bus service to the new portal at a fare which just pays for the driver and the gas and oil.

Between shifts at Hubbard's new portal. The men coming out are headed for the new bath and change rooms.

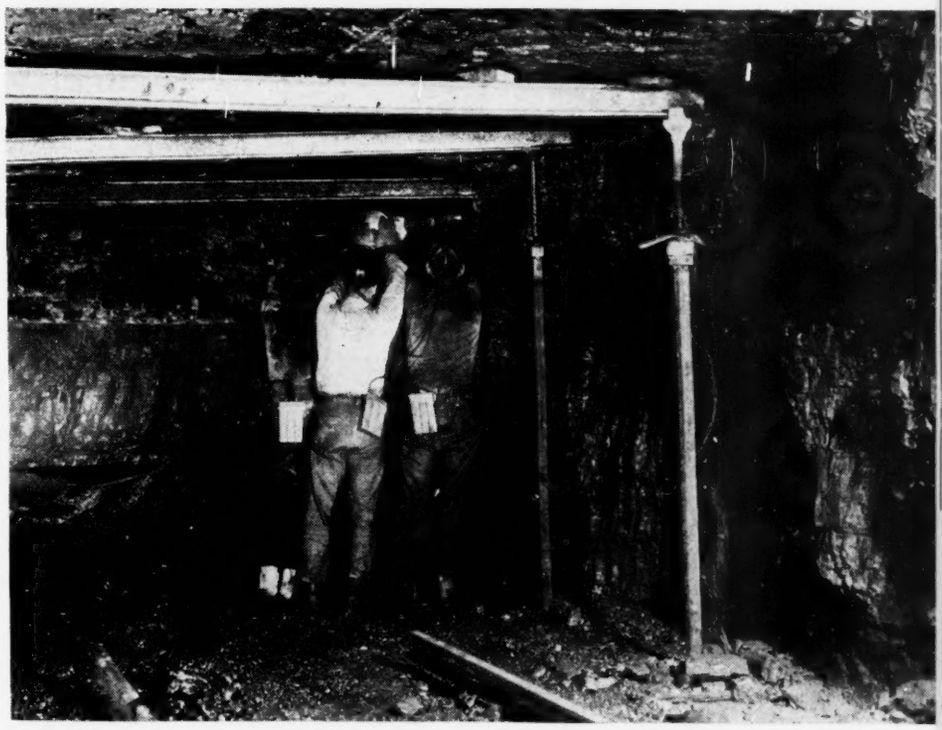
Navy Bureau of Medicine and Surgery and under the federal Pure Food and Drug Act. Its primary purpose is preventing athlete's foot infection. Where the infection exists, however, it is stated that Peda-Spray is effective as a treatment. The dispenser—illustrated elsewhere in this article—holds 3 gal. of solution. This quantity, according to William J. Maize, superintendent, lasts the 160 men now using the washhouse six to eight weeks. A worker can step on the dispenser and in three seconds coat his feet thoroughly in the fine mist-like spray. The skin takes up the solution quite readily.

Foremen's Quarters Separate

The foremen's office, change room and wash and change facilities are, as noted, in a separate section of the building adjacent to the lamp house. In addition to the hoist room, there are first-aid, electrical-control and boiler rooms. Roof ventilators are provided in the principal rooms of the building and, except for the wash rooms, all rooms are heated by blower-type unit heaters.

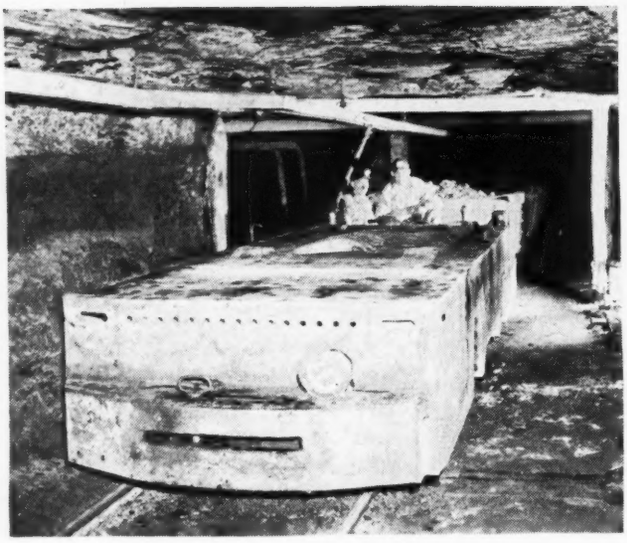
For water, a dam was built across a small ravine about 500 ft. from the portal. Water from this reservoir is treated with chlorine before it goes to the showers. Drinking water is obtained from a nearby spring and tests show it to be excellent.

Improvements at Hubbard have not been restricted to changes in the surface plant. Timbering standards, both in entries and in rooms, have been revised in the light of a year's investigation of aluminum crossbars. Experience has indicated that 4-in. aluminum-alloy H-beams are quite satisfactory for roof supports. Hubbard has standardized on the 15-ft. length for rooms and 11-ft. for entries. At the face, where the majority of the accidents occur, the beams are installed in sets of three on 6-ft. centers. They are sup-

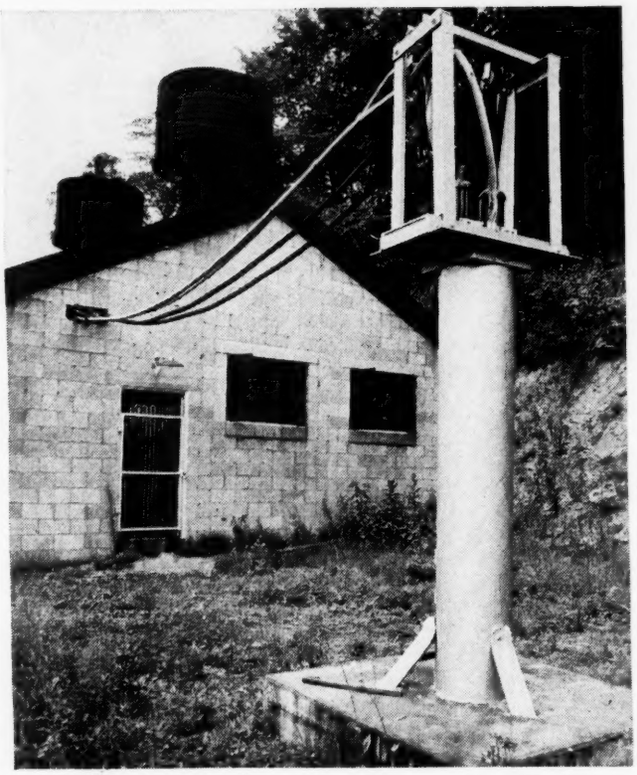


Aluminum H-beams, in sets of three, are used on 6-ft. centers at the faces of the rooms.

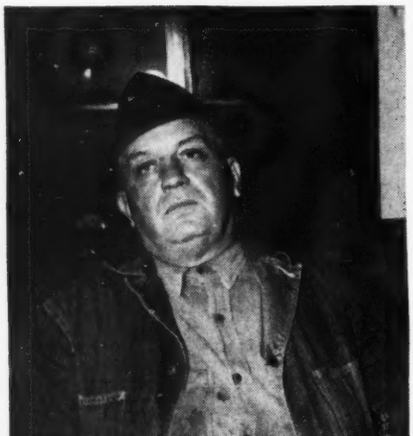
These 4-in. 15-ft.-long aluminum beams are used to timber 18-ft. rooms.



This 15-ton locomotive was recently added for main-line duty.



Bare stranded aluminum cables are used in the negative circuit in the drillhole. Insulated aluminum cable also may be had.



William J. Maize is superintendent at Hubbard mine.

Outside the hoisting room at the old shaft: William A. Baer (left) outside foreman; James J. Judge, hoisting engineer; Calvin Hunter, trucker boss; and Eddie Hartzell, supply clerk.

ported on screw-jacks. As the face advances, the beams and jacks are moved ahead, the rear one first and then the others in turn.

Management cites two advantages for the aluminum beams. First of all, they are light. For example, a 15-ft.-long aluminum crossbar weighs only 70 lb. as compared to 200 lb. for a 6x6 by 14-ft. wooden crossbar. Two timbermen, instead of the three required in the case of the wooden timbers, can easily place the aluminum crossbars. The ability of the aluminum beam to deflect or bend under weight without snapping in two is another advantage cited. The aluminum beam is not only stronger but will not break without giving ample warning by bending. Incidentally, the aluminum crossbar can be subjected to considerable bending before it must be straightened mechanically, since the alloy used is quite springy and tends to assume the original alignment.

Aluminum Acid Resistant

In addition to lightness and strength, aluminum beams are durable. Being acid-resistant they will last a long time. Barring mechanical mishap, they can be used over and over. This means lower timbering cost and less handling of supplies on the surface.

Aluminum cable is replacing copper on the positive and negative feeder circuits of the 275-volt d.c. underground system. The aluminum cable is reported to be cheaper and, being acid-resistant, is more suitable for stringing as a return line on the entry floor. Bare stranded all-aluminum cable with a conductivity equivalent to a 500,000-cir. mil copper cable weighs only 74.6 lb. per 100 ft. Lighter cable means lower installation costs. This cable also is available with an insulated covering. The bare cable, illustrated elsewhere in the article, is used in the return circuit of the drillhole installation. All substations at Hubbard are kept on the surface and the d.c. power enters the mine through drillholes.

ATOMIC POWER:

Will It Compete With Power From Coal?

Production of Electricity Most Likely Field for Atomic-Power Competition—Safety and Waste Disposal Big Factors—Available Data Indicate Competition May Be Possible if Coal Rises More

By **EUGENE SNYDER**
McGraw-Hill Economics Staff

DURING 1946, miners dug 532,000,000 tons of coal, which was used, among other things, to make two-thirds of the country's electricity. At the same time, work was progressing on an experimental plant at Oak Ridge, Tenn., to produce electricity by splitting atoms. Will this new source of power replace, compete with or merely supplement the use of coal?

Predicting the future of atomic energy is, so far, an adventure in deduction. We lack facts because nuclear science is in its infancy and because barriers of international secrecy keep hidden much of what has been discovered. Nevertheless, by hedging all direct statements with qualifications, we can hazard a guess or two about general trends and probabilities.

It must be realized at the outset that electricity production is the only field on which atomic power and coal are likely to meet as competitors in this generation. The size and weight of the atomic plant seem to preclude its use for replacing coal-burning locomotives. Application of atomic energy to ship propulsion might impinge on coal. But since less than 0.4 percent of the U. S. coal output is used by vessels of all types, such a development would be of negligible importance. Furthermore, only about 15 percent of the coal is used for making electricity, including both utility and industrially-generated power. So, even if the electric utilities shifted entirely from coal to atom-splitting, it would hardly be a death blow to the coal industry.

Such a shift seems unlikely in the near future—at least in areas situated conveniently to large coal deposits. But atomic energy could compete effectively in newly industrialized areas or as new electric power stations are built to meet a growing demand for electricity. It appears, however, for reasons detailed in this article, that atomic energy in the foreseeable future may supplement, but not replace, existing fuels.

All matter is made up of atoms, which have a center, the nucleus, and a certain number of surrounding particles, called electrons. Most nuclei are made up of particles called protons and neutrons. Neutrons do not occur independently in nature but may be separated artificially. When a neutron enters the atom of certain elements, the nucleus of that atom splits in two. This reaction is called fission.

The elements that are fissionable in such a manner are: (1) a form of uranium, called uranium-235 (the more abundant non-fissionable form is called uranium-238), and (2) plutonium, a man-made element created from uranium-238 in the fission process. The possibility of using the more abundant thorium has been hinted. When one of these atoms splits, additional neutrons are given off which can enter and split neighboring atoms, and this chain reaction can go on until most or all the fissionable atoms in the piece of fissionable material have been split. In the process, large quantities of heat are released. It is this heat that may be turned to useful ends.

Nuclear fissions may take place in two types of reactors: primary and secondary. In a primary plant, the uranium-235, which makes up only 0.7 percent of pure natural uranium, is split. Three products result from this primary reaction: (1) heat, which can be used to make steam and electricity; (2) plutonium, which is formed from some of the remaining 99.3 percent of natural uranium; and (3) radio-active byproducts.

A report of the Carnegie Endowment Committee on Atomic Energy estimates the theoretical breakdown of fission products produced at a primary plant in a year's operation. Prof. J. B. Condliffe represented the committee at the University of California, where the report was prepared with the cooperation of the Northern California Association of Scientists. Figures on primary-secondary reactors and capital costs are based largely on this report, which outlines primary-plant operation about as follows:

Input—10,000 lb. of highly purified natural uranium, costing somewhere between $10 and $20 a pound.

Output—Heat to make 500,000 kw. of electricity for one year from the fission of about 70 lb. of U-235 in the natural uranium plus a part of the U-238 that was converted into plutonium;

500 lb. of plutonium separated for sale to secondary plants;

500 lb. of radio-active byproducts;

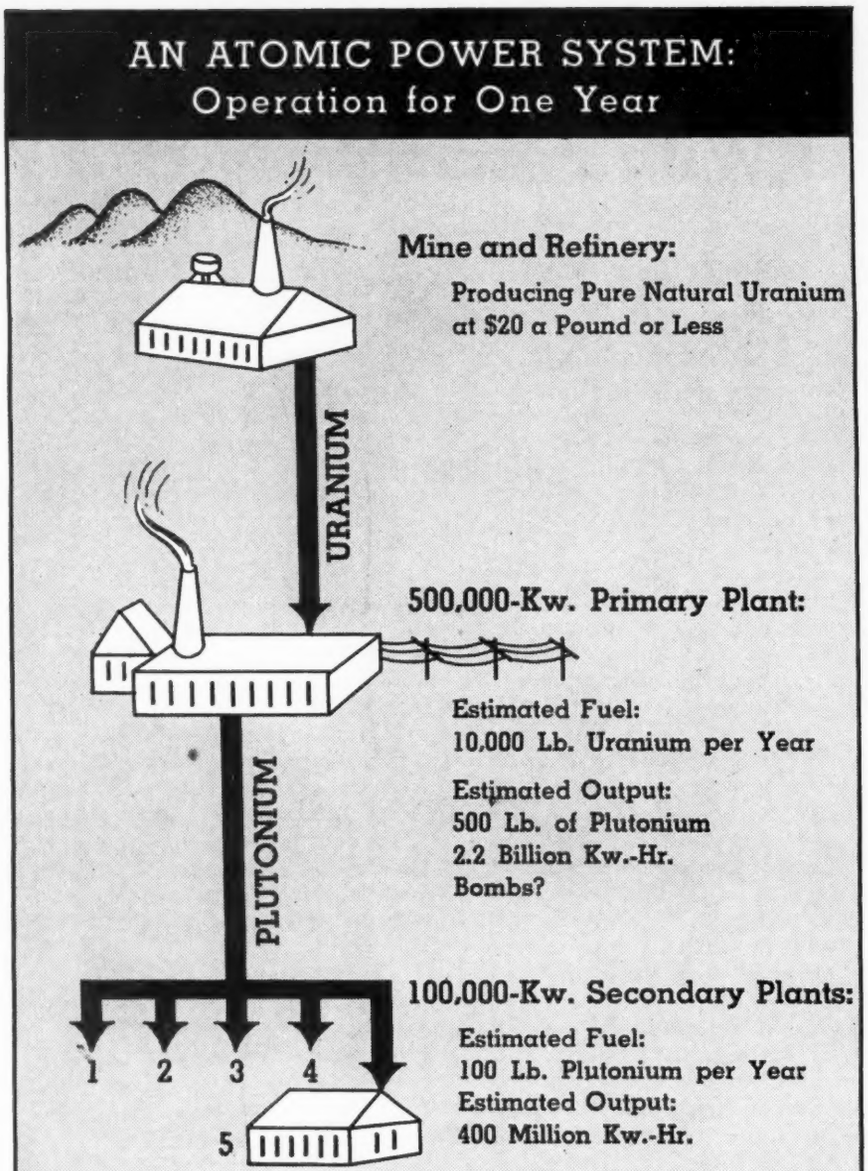
Waste—the remaining natural uranium (about 9,000 lb.).

The plutonium produced at the primary plant can be sent to the secondary plants, where it is split to produce additional power. Or it may be made into bombs, in which the plutonium splits all at once.

Because the useful, as contrasted with the destructive, fission reaction does not differ from that in exploding bombs, the big hurdle confronting atomic energy in the future is not scientific or even economic but political. This is pointed up by the fact that the primary and secondary plants also are referred to as "unsafe" and "safe," respectively, as to military potentialities.

It is believed that the plutonium sent to secondary plants can be made unsuitable for use in bombs by adding certain impurities. Such fissionable material is said to be "denatured." But the primary, or "unsafe," plant could produce plutonium suitable for explosives on very short notice or it could withhold part of the production so that it would have to be very carefully supervised.

It also has been hinted that plutonium fission, like uranium fission, may result in the production of more plutonium if natural uranium is pres-



ent in the reactor. But even though this were possible in theory, the secondary plant would have to be designed and operated to prevent it for reasons of security and control. Otherwise, since the power station would be producing "unsafe" plutonium from "denatured" plutonium, it would be too easy to make bootleg bombs.

Uranium, practically valueless until 1940, is quite abundant but does not occur in concentrated deposits. Ore containing a low content of uranium is practically limitless. Though the mining and purifying processes are expensive, the top limit for pure natural uranium ready for the primary pile should not exceed $20 per pound. Since the heat from a piece of fissionable material the size of a marble is equal to a carload of coal, the cost would not be prohibitive.

Present studies show that the cost of the purified uranium to make power in a primary plant is practically zero. Figuring on the most expensive ores likely to be tapped in the next 50 years, it is unlikely that the cost of the purified uranium will at any time exceed 1/100c. per kilowatt-hour produced by the primary plant. Thus, uranium cost will have no effect on the practicability of atomic power plants. That will be decided by other factors.

For converting heat energy from fission into electricity, we visualize—hypothetically, of course—a large pit lined with thick concrete and insulation to protect personnel from the deadly rays of the radio-active wastes and byproducts created in the process. For this reason, too, most plant operations would have to be carried on by remote controls.

In the center of the pit would be a stack of fissionable material and carbon called the "pile." This would be surrounded by some circulating liquid which would absorb the heat and carry it away, acting as a cooling and heat-transfer agent. The pipes carrying the circulating medium would be surrounded by steam or compressed-gas coils. The high-pressure steam produced would then be run through turbo-generators and from there on everything would be done in the ordinary way. This arrangement would be about the same in either a primary plant running on uranium and producing plutonium or in a secondary reactor running on plutonium.

The installation would include a chemical plant for purifying certain desirable byproducts. There would also be radio-active wastes, extremely dangerous to life. A safe method for their disposal would be necessary. This disposal problem would be a factor in determining the location of atomic plants—at a safe distance from populated areas.

The whole process sounds complicated and expensive, but the forces involved are so great and the energy released so immense for the cost involved that the atomic plant may be able to compete economically with coal-fired steam power plants.

Competition a Cost Matter

When and where such competition would be possible depends on cost of at-the-generator electricity produced by atomic and coal-power stations, modified by transmission costs if safety required the atom plant to be a considerable distance from the market. All the other and major costs of retailed electricity would remain the same. Since this cost of generation is only 13 percent of the total expense of electricity to the consumer—taxes and distribution are the principal costs—it is obvious that "free power" is not in the offing.

What components make up the cost of generating electricity and which of them would be different for coal and atomic plants? These costs can be classed as follows:

1. Capital costs for building the power station, which determine such fixed charges as taxes and amortization.
2. Operating, or mining, costs.

No one knows exactly what it would cost to build an atomic power plant. Compared with a conventional coal-steam station, the atom plant would save money by eliminating coal handling and firing but the protective shielding and remote-control mechanisms would be added expenses. One

estimate, in a report by Dr. C. A. Thomas, technical director of operations at the Oak Ridge, Tenn., laboratories, prepared for Bernard Baruch and the United Nations Atomic Energy Commission, places the cost of a 75,000-kw. atomic plant about equal to that of a hydroelectric power station; that is, about 2½ times the cost of a comparable coal station. The prewar average for steam-plant construction was $100 per kilowatt and for hydro plants, about $250. Estimates on capital and fuel costs for a 75,000-kw. independent pile are based on the Thomas report. Construction costs for a 75,000-kw. independent power station using various fuels are estimated in the Thomas report as follows:

Coal	$10,000,000
Typical hydroelectric	$25,000,000
Atomic	$25,000,000

The atomic figure is for a single reactor of relatively small size which would use uranium and recover the plutonium produced for later consumption in the same plant. But a number of such small independent plants would be less economical to build than a network of equal total capacity made up of the primary and secondary plants already described. This is because each independent plant would duplicate the atomic installation's most expensive feature, which is required only at primary-type piles—that is, elaborate chemical separation and processing plants. Also, each independent plant of the kind pictured in the above estimate would be an "unsafe" operation, militarily speaking. For these reasons, atomic energy, if it overcomes political obstacles and develops on a large scale, will likely be used in primary-secondary systems.

Plant Size vs. Cost

The estimate placing the construction cost for an atomic power station at twice that of a comparable coal station is based on 75,000-kw. plants. But the optimum size for atomic plants may be much larger. The cost of building a coal plant varies directly with size—$100 per kilowatt of capacity was the 20-year average up to 1940. But the cost of atomic power stations is not determined so much by size as by those features required in any atomic installation—remote controls, shielding and waste-disposal facilities. The Carnegie report, in discussing costs for a primary, or independent-type, plant, stated: "A pile unit producing 200,000 kw. could not be expected to cost very much less than one producing 1,000,000 kw."

It may turn out, therefore, that large atomic plants—500,000 kw. or more, for example—can be built for no more than coal plants producing an equal quantity of power. However, not many localities and few power systems could absorb power in such large blocks—the electricity capacity for an average metropolitan area in the U. S. is between ½ and 1 kw. per person. On this basis, only a dozen or so American cities could use such a plant. Present markets for such large quantities of power are all accessible to coal transportation facilities or to hydroelectric installations.

Distance a Factor

Finding a market for the large blocks of power produced either by an independent atomic plant of economical size or by the primary pile of a primary-secondary network is further complicated by the fact that the plant must be located a safe distance from populous areas. No estimates are available as to what this distance will have to be. It will depend on what means of radio-active waste disposal are developed. But the transmission of electricity for great distances from plant to load-center is not practicable as yet.

According to *Electrical World* (June 20, 1936), the cost of transmitting electricity 200 miles is about 2.4 mills per kilowatt-hour—a sizeable and almost prohibitive cost when power can be produced at the market by a coal plant for a total operating cost of 3 or 4 mills per kilowatt-hour. The report stated that:

"Transmission of electrical energy is found to be more costly than the hauling of equivalent coal, making it more economical, under conditions frequently encountered, to generate power near the demand from fuel than to supply it from a distant water-power development".

Whether safety factors will force the atomic plant to be built such a distance from cities that transmission costs will become a decisive factor remains to be seen. But both that cost and the problem of finding a market which can absorb such a large quantity of power will be important.

The transmission and marketing problem is a third factor, in addition to capital cost and military safeguards, that makes the primary-secondary setup more feasible. For, though the primary power will come in large quantities, the other half of the power will be available at smaller, more convenient secondary plants. The Carnegie report estimates the capital costs for such an atomic power system (1,000,000-kw. capacity) about like this:

One 500,000-kw. primary plant (producing 500 lb. of plutonium annually)	$70,000,000
Five 100,000-kw. secondary plants (burning 100 lb. of plutonium each annually)	$55,000,000
Total capital cost	$125,000,000
Coal: ten 100,000-kw. stations at $13,000,000 each	$130,000,000

The determining factor in comparing atomic and coal-plant capital costs seems to be the extent to which atomic power is developed. If other influences, military or political, restrict it to a relatively few independent primary-type piles, construction costs will not be spread very thin and will, apparently, exceed those for coal plants of equal capacity. If, on the other hand, the development is widespread and involves large installations, atom plants would cost about the same as new coal plants. Such is the indication of the meager information available. Therefore, to get on to the more basic question of fuel costs, we may make the sweeping generalization that differences in construction costs and fixed charges, if they exist, will not be great. If development is restricted, the political factors that force the restriction will probably bring about a program of government sponsorship that would be carried out without reference to costs.

Fuel Big Coal-Plant Item

Once the power station has been built, what are the components making up the cost of producing electricity? In a typical coal station, fuel cost is three-fourths of the total production expense, which breaks down as follows:

Operation, all wages	13%
Fuel	74%
Maintenance	11%
Miscellaneous supplies	2%

It seems probable that the operating expenses, aside from fuel, would be about the same for coal and atomic plants. Though it is possible that some labor might be saved at the atom plant by eliminating coal storage and handling, this probably would be equalized by the wages of the more expensive highly-trained personnel needed. In any case, the only significant difference would lie in fuel costs—and transmission costs of waste-disposal factors keep the plants far from load-centers.

Whether nuclear fuel can be competitive with coal seems to depend, as in the case of capital costs on the extent to which atomic-power systems are developed. The report based on a

single independent 75,000-kw. plant concluded that atomic fuel would be more expensive than coal, but that operating costs would be equalized between coal and atomic plants if coal cost $10 a ton. On the other hand, the estimate based on a network of primary-secondary plants concluded that the cost of nuclear fuel would be almost zero.

Coal Efficiency Reached?

The cost of coal as a fuel has three components: (1) at-the-mine cost, (2) transportation and (3) the efficiency with which coal is converted into heat and power. The price of coal at the mine has shown a gradual increase in the past decade. The cost of transportation, which had not varied appreciably in many years, also went up recently and is likely to go up still more. On the other hand, the efficiency of use of coal in steam plants also has been increasing. Since 1924, when the typical steam plant consumed 2 lb. of coal per kilowatt-hour of electricity, the ratio has dropped to about 1 lb. However, indications are that, barring new developments, the optimum efficiency has just about been reached. Any further improvements in coal-station efficiency will be small and would involve more expensive equipment.

In a small independent atomic plant, the capital cost would not be spread so thin, so that the estimated cost of the power from such a plant would be about 8 mills per kilowatt-hour. The operating cost for power from a hydroelectric station is about 2 mills per kilowatt-hour and from a coal station about 3 or 4 mills. A survey of 56 large steam plants, averaging 75,000 kw. in capacity, showed an average operating cost of 3.4 mills per kilowatt-hour, according to the "Steam-Station Cost Survey," *Electrical World*, Dec. 2, 1939. The figure for hydroelectric plants is based on the 1945 annual report, Columbia-Bonneville hydroelectric project. If atomic energy is developed to any extent, however, mining and transportation costs will be negligible. There is no reason to believe that uranium in a form ready to be admitted to the primary pile should cost any more than $20 a pound and it probably will be somewhere $10 and $20.

Fissionable material produces about 2½ million times more heat than an equal quantity of coal. Using this figure as a basis, it has been estimated that 10,000 lb. of natural uranium, containing the normal 0.7 percent uranium-235, would be adequate to supply a 500,000-kw. primary plant for one year and that about 500 lb. of plutonium would be produced. This plutonium-production estimate is arrived at from available data indicating that for every 10,000 kw.-hr., 1 gram of plutonium could be separated. In a year's operation, this primary plant would produce 2.2 billion kilowatt-hours (at 50 percent efficiency, fission heat to kilowatts) and 220 kg., or about 440 lb., of plutonium. By using all available neutrons, concentrating on plutonium formation and reducing by-product formation to a minimum, the production of plutonium should reach 500 lb.

It also has been estimated that 100 lb. of plutonium would supply a 100,000-kw. secondary plant for one year. Therefore, it is clear that transportation cost would play no part in nuclear energy expenses and that fuel cost, at least for the primary plant, would be almost nil. It works out to about 1/10 mill per kilowatt-hour.

The economics of the primary and secondary plants are inextricably intertwined. The basic unit is not the single station but a network made up of the primary plant and about five secondary plants. This makes it very difficult, for example, to arrive at any estimate of the cost of plutonium for the secondary plants. For the secondary plants to be competitive, the plutonium would have to be available to them for $20 per gram or less. Thus, the cost of a year's supply of fuel (50 kg. or 100 lb.) would be $1,000,000. This secondary 100,000-kw. plant would produce 400,000,000 kw.-hr. (at 50-percent thermal efficiency) and, if this power were sold at 3 mills per kilowatt-hour, the annual revenue would be $1,200,000. There seems to be no scientific or economic obstacle to selling the primary plant's plutonium output for $20 a gram ($10,000 a pound) or even considerably less.

Competition by 1960?

Prof. J. Marschak, a well-known economist, writing in the Bulletin of The Atomic Scientists, Sept. 1, 1946, has indicated that in his judgment "atomic energy can compete with coal —even in this country of cheap coal— within the decade 1950." Even if political impediments should prevent the large-scale development on which the above figures are based, the point where an independent atomic power station could be competitive might be reached if the present upward trend in coal costs continued.

The possibility of improving the efficiency of long-distance electricity transmission must not be overlooked as a future development.

If electricity could be transported more economically, the marketing problem of the 500,000-kw. primary plant would be solved.

The radio-active byproducts created in the fission reactions would have some value. Lack of data makes it impossible to decide what part, if any, they would play in nuclear economics. It is quite possible that the cost of disposing of the radio-active wastes would cancel out the income from useful by-products.

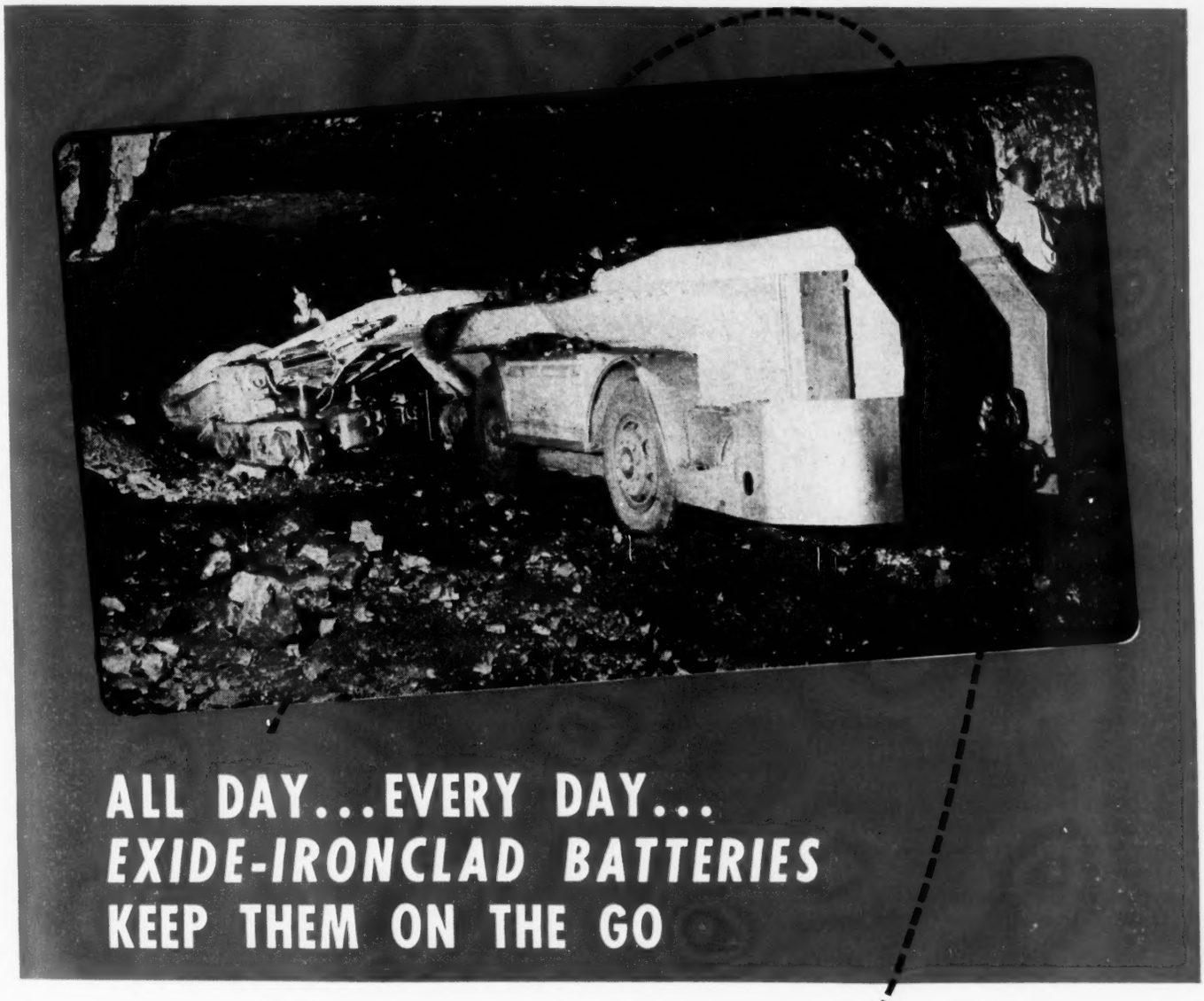
Assuming that the problem of controlling atomic energy for peaceful use is somehow solved—a tremendous assumption—there seems to be nothing to prevent atomic plants from competing with coal plants, even in great coal-producing areas, unless coal can be turned out at a cheaper price.

New Plants the Challenge

The real challenge of nuclear power will not be so much for existing plants as for new construction. The cost of power from a secondary atomic station, if any revenue at all is realized from the sale of the primary plant's power, thus decreasing the price of plutonium fuel, would be somewhere between the 3.4 mills per kilowatt-hour for a coal station and the 2.0 mills for a hydrostation. But since power-station operating expenses are a minor factor in total electricity costs, capital-cost considerations would likely make it uneconomical to junk existing coal equipment that is not worn out or obsolete. However, atomic energy can offer stiff competition in the new-construction field if not hamstrung by politics. Atomic energy would make possible a decentralization of industry, for which it would be especially well suited. It also would impinge on coal by making possible the industrialization of areas that have had all the necessary resources but coal.

The fact that nuclear fission is a cheaper source of energy than coal will not, however, automatically guarantee its use. It is quite possible that nuclear plants will be built by the government principally for military purposes and that exploration of the real potentialities of nuclear power will be only incidental. Even though the plants were not for military purposes, they would have to be built and controlled by the government under the provisions of the act for the national control of all atomic energy. They probably also would be internationally inspected.

One thing is certain—before it can be turned to useful work, this newly-freed genie will have to be brought under intelligent international control.



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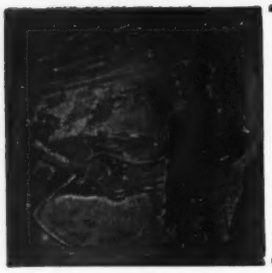

The Foremen's Forum

Quiz-O-Gram Gets the Answers At Coal Mining Institute Session

Mining Specialists Offer Expert Information On Electricity, Mining Education and Safety

At the annual meeting of the Coal Mining Institute of America, members of the institute presented the following questions which were answered by several specialists. The names of these respondents follow their several replies.

Fighting Electric Hazards

Q.—Because of the difficulty of maintaining a return in both rails in room entries, would one bonded rail and one return wire laid parallel to the track and connected to that track at 200-ft. intervals be a more effective return than could be obtained by trying to maintain a return in both rails?

A.—Returns in room entries are difficult to maintain because room switches are being cut in and cut out. In bridging switches, a wire parallel to the track would be preferable to bonds around track switches and much surer in operation. Track bonding in room entries is difficult to maintain as the track is frequently disturbed to cut in switches. (Answer by *A. L. Barrett, maintenance engineer, Pittsburgh Coal Co.*)

Q.—Should the fuses used to protect electrical equipment be submitted for approval before they are permitted to be used? If so, why?

A.—Unfortunately trolley taps are not standardized. The blowing time of fuses varies as much as 6 to 1. The fuses also, if they are not suited to the amperage and the voltage classification, are likely to explode after they have blown. The U. S. Bureau of Mines should set standards for the fuses to be used with permissible machines. As present conditions rule, underwriters do no look with approval on trolley taps. (*A. L. Barrett*)

Circuit-Breaker Protection

Q.—Why aren't circuit breakers complete protection against mine fires of electrical origin?

A.—To consider a typical case, circuit breakers may be set to sever the circuit whenever the current passing through them to the load exceeds 1,000 amp.; this, with 500-volt mine current, represents a resistance of ½ ohm. Fault currents capable of starting fires may be much lower than this and the breaker cannot distinguish between load current and fault current and will not trip as long as the total current is below 1,000 amp. In some circuit breakers, the tripping current is set to exceed 1,000 amp., which is a more dangerous current intensity if a short circuit should occur. (*A. L. Barrett*)

Q.—What advances have been made in the development of underground communication systems?

A.—Much progress has been made in wireless underground communications. A frequency-modulation radio system is used. In some instances, the equipment costs of about $600 per equipped locomotive may be more than justified. With it, for example, the trip dispatcher has better contact with his motormen, and that may spell a greater efficiency in haulage and an increased tonnage hauled. Development is under way to provide battery-operated sets for emergency use. When developed, these sets should be valuable equipment wherever men are shut in by a fall or an explosion and, in such a case, this method of radio communication might many times justify its cost. (*A. L. Barrett*)

Q.—Would it be of any value to the mine management to know the condition of the bonding, particularly in room entries since in these the bonding is likely to be disturbed? Has any research of this sort been made?

A.—Yes, it is highly desirable to test the resistance of the track return at frequent intervals. A simple test of bonding is in process of determination and will soon be made available to everyone. (Answer by *F. E. Griffith, Pennsylvania State electrical inspector.*)

Q.—Is multiple firing of shots safe with the tolerances permitted in the firing time of the detonators manufactured today?

A.—The bridge-wire resistances of detonators used to vary greatly. It now ranges from 0.7 to 1.3 ohms. The standard and best resistance is 1 ohm; 1.3 ohms is too much. Less difficulty with bridge wires is now experienced. (*F. E. Griffith*)

Q.—What is the most effective way to provide a satisfactory ground for a track-mounted cutting machine where 500-volt direct current is used in a butt entry which is track-bonded on one side, the room track not being bonded.

A.—There is no need to provide a ground for the track-mounted machines when traveling. The wheels, if not rubber-tired, will connect the machine electrically with the steel track. Where a shortwall machine was connected to its machine truck, the resistance to ground was only 6 ohms. The potential of the truck was near that of the ground. (*F. E. Griffith*)

Q.—Are shotfiring cables, regarded as trailing cables, as defined by the Pennsylvania Mine Law for fire-resistant cables?

A.—No. Shotfiring cables are never made fire-resisting and the law does not contemplate any such construction. (*F. E. Griffith*)

Education in Mining

Q.—Are training-within-industry courses of value to the coal industry? If so, what will it take to keep the training alive after the course has been completed?

A.—Undoubtedly such training is quite helpful. It promotes methodical thinking, which is much needed. There is a definite best way of doing any job and the man who is to do it should know that way. That training should be continued, both to keep alive what has been learned and to adapt it to new conditions. (Answer by *W. J. Griffith, assistant to the general superintendent, Vesta-Shannopin Coal Division, Jones & Laughlin Steel Corp.*)

Q.—Does the coal industry offer opportunities to young men equal to those afforded by other leading industries?

A.—There is no more desirable field for young technically competent men. Their advance will be rapid. They will have a better chance of getting a good year's earnings than most doctors. (*W. J. Griffith*)

Mine Safety Questions

Q.—Do you think that reasonable safety standards interfere with production? Elaborate if you will.

A.—No. As a rule, they merely require that work be done immediately that in any event would have to be done eventually. (Answer by *W. D. Northover, safety director, Rochester & Pittsburgh Coal Co.*) (*Continued on p. 92.*)

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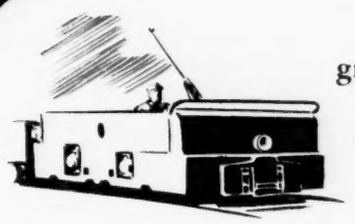

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PRODUCERS OF PETROLEUM SINCE 1887

Q.—Do you believe that we need additional supervision of working places to reduce accidents, and why?

A.—As, today, we have fewer working places to supervise, I think the present force adequate. Keener observation rather than more supervisors is our present need. Some men need more supervision, especially in hand loading, but what we need with mechanical loading is not more, but better, supervision. (*W. D. Northover*)

Q.—(a) The State law and the federal code provide that when a shot misfires a hole must be drilled 12 and 24 in., respectively, from the misfired shot. After this has been done, the misfired shot still remains in the hole. How should it be removed? (b) When a misfired shot is the last shot in the cut and the coal is broken to a point less than 24 in. from the misfired shot, what is the proper procedure to remove the shot? (c) When a shot has misfired, why is it not safer to endeavor to shoot it from the trolley wire than to drill and shoot another hole and still have to remove the powder?

A.—The only safe way of removing the explosive in a misfired shot is to blow it out with the coal or other material into which it has been drilled, and to do so by igniting a charge in a hole drilled either under or beside the misfired shot. This hole should be drilled by hand, not by machine. Never blow out the explosive by a lead from the trolley wire. (*W. D. Northover*)

Other Safety Questions

Q.—Should the shotfirer, in mechanical loading, be permitted to use an electric cap lamp in addition to his flame safety lamp while performing the duties of a shotfirer? If you favor carrying both kinds of lamps together, what advantage do you think the shotfirer will obtain from having both lamps available at all times?

A.—In early days, the shotfirer carried a Davy or Clanny and an open-flame lamp. He left his open light behind before he went up to the face to test for methane. Finding it safe for use of the open light, he returned for that lamp and examined the roof and coal. So it became customary to make the two examinations separately, but today the lamp used to light the face is safer than the flame safety lamp. So the two can be used together.

Judging by the number of records of "dangered places" in our mines, it would seem that the principal job of the shotfirer is to protect the miner against bad roof rather than methane. "Fireboss" seems a misnomer. We would do better to call him an "examiner," as in Illinois. By all means, let him carry and use both lights. (Answer by *C. R. Stahl, assistant to the vice-president, Koppers Coal Division*).

Q.—Could not more benefit be derived from an increase in the number of State mine inspectors and a decrease in size of districts rather than a decrease in the number of Federal mine inspectors, in which case the Federal mine inspectors would act in an advisory capacity?

A.—No. Quality inspection rather than quantity is what is needed. (*C. R. Stahl*)

Q.—Discipline has long been regarded as playing a very important part in accident prevention. How can discipline be maintained by operating officials under present-day labor conditions?

A.—Discipline is not the major consideration in promoting safety. Capable safety men will give the employees confidence in their advice. But men still must be sent out of the mine if they violate rules. Whether the approach to safety should be through counsel, discipline or both, is even today a much debated question. (*C. R. Stahl*)

•

Portal-to-Portal, With Nothing Done

Even in well-conducted mines, leakage of air through stoppings, doors, overcasts, coal pillars, floor and roof often waste as much as 30 percent of the air supplied to the mine. Because of ill-constructed or deteriorated stoppings, doors and overcasts or because of high air pressures and lengthy travel, the loss in many mines is even more.

Helpful and Harmful Leakage

Surface Openings, Cracks and Cavings—A leakage from surface to intake, such as may occur when the mine is ventilated by an exhaust fan will, however, improve ventilation, in most cases, because it shortens air travel and because the inleaking air, before it leaves the mine, does its work as effectively as air that enters by recognized and provided channels. On the other hand, a leakage from surface to return, such as may occur with an exhaust fan, is always undesirable, as the entering air clutters the return and does nothing to pay for its transportation as well as interfering with the travel of other air that has already traversed the face.

The probable leakage points at stoppings, doors and overcasts should be inspected carefully by the men whose business it is to construct them, or by foremen or firebosses, but only after they have been duly instructed as to what defects are likely to have developed in such construction during the passage of time. Emphasis should always be placed on overcasts. They are the most wasteful of all ventilation structures because they are so roughly used, expose so large an area to leakage and too often are imperfectly fitted at their sides to the mine roof.

Air Lost to Return—Inordinate loss of air along the headings from intake to return results in a prodigal waste of power, which no mine can afford. The quantity of air entering and leaving the mine is not the true measure of ventilating adequacy. Volume of air entering the mine is not as important as aggregate volume of air at the last crosscuts of the several working entries, nor as vital as an equal distribution of that aggregate to the several working places to be serviced or to the several volumes of methane and carbon dioxide that have to be moved from those places.

Remember always that it is the innermost room entry that it is most difficult to ventilate, for the pressure differential between intake and return is least of all at that remote entry. Yet it is that same entry which usually is located in the most virgin coal, where most of the methane is normally emitted. Because of the remoteness of this entry, however, leakage of air is at a minimum because of the lowered pressure differentials at crosscuts.

In and Out Without Purpose

Every Crosscut a Potential Power Waster—It is, in particular, extremely inefficient to push a large volume of air through the passageways and then, when the workings are approached, let it go into the return without ever reaching the face that it was intended to ventilate. It would be just as foolish for a man to travel several miles to his working bench and then turn around and come back with nothing done.

With some of the mine air, it is all portal-to-portal travel, yet with nothing worthwhile accomplished. Such waste of air is especially undesirable because the portal and all the roadways leading up to the live portion of the mine are already congested with the air traveling to all the several live workings, making it difficult to get the helpful air to the place where the work of ventilation largely is done. To use these congested airways to take in air that is only going to be wasted merely adds to the congestion without any amelioration of operating conditions.

Thrice Detrimental

Three Ways in Which Air Loss Is Wasteful—Loss of air is invisible waste and only close inspection can prevent it. Unfortunately, we have no way of beclouding the wasted air so that its immense volume can be seen and appreciated. If it were possible to see the wasted air, no one would be satisfied to let such a volume of waste occur but, even if we could see it, we would not note the big loss which comes from its interference with the travel of the really helpful air that alone achieves the work of ventilation. Such wasted air is detrimental, not only because (1) it is wasteful, but also (2) because it crowds the air that we want to carry to the face and (3) thus makes it necessary to raise the pressure which in turn causes leakage and makes a still greater fan power and volume obligatory.

And it wastes not only on entering the mine but also on leaving it. But loss of air to the surface in the return, as may occur in a mine with a pressure fan, is helpful for the quantity of air that has to travel the return airways is thus reduced. Here, however, lowered pressure must be credited with increasing leakage in the intake, though it lowers back pressure and thus increase air travel.

We lay altogether too much stress on the equation $p = ksv^2 \div a$, for the velocity may not be only squared, that is, raised to the power of two, but lifted to a still higher power if the resistance to air travel is considerable. In other words, the power to which v is raised will be more or less than two if the velocity of the air is increased or diminished.

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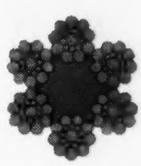

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Operating Ideas

Rock Dump Features Efficiency and Safety

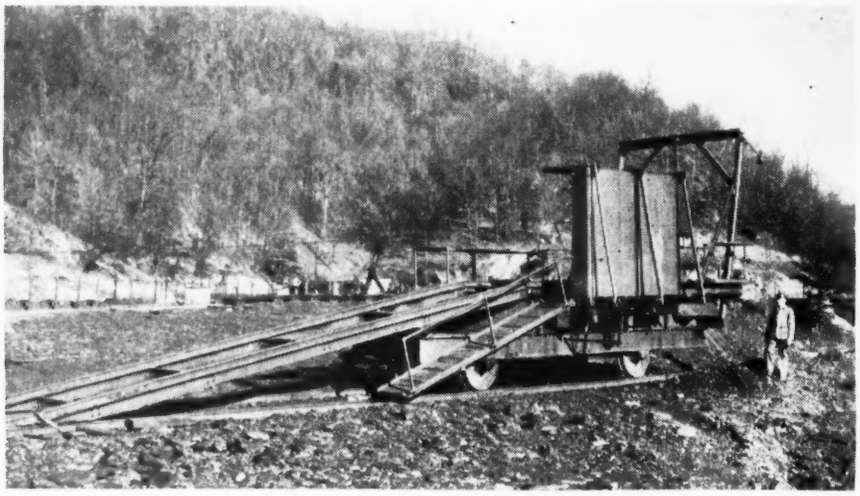
PERFECTION from the standpoint of convenient operation, safety, long life and low maintenance was the goal in the designing and building of a portable mechanical rock dump in the mine shop of the United Pocahontas Coal Co., Crumpler, W. Va. The result is a portable car dumper of which J. C. Snyder, chief electrician, is justly proud. This unit, incorporating novel features and sturdy construction, is installed at Zenith Mine where slate and mine rock is being dumped from lift-endgate mine cars to a level-top refuse pile in the hollow near the main portal.

The dump is self-propelling at 56 f.p.m. by a 5-hp. 275-volt motor and contains a car hoist with a rope speed of 180 f.p.m. operated by a 20-hp. motor. Track gage is 56½ in. (the same as the mines), axles are on 14-ft. centers and standard railroad-car wheels are used. Dumping is done over the end by a gravity-operated kick-back horn dump controlled by a lever and brake on the sword. Rails on the dump platform are 6 ft. above the track.

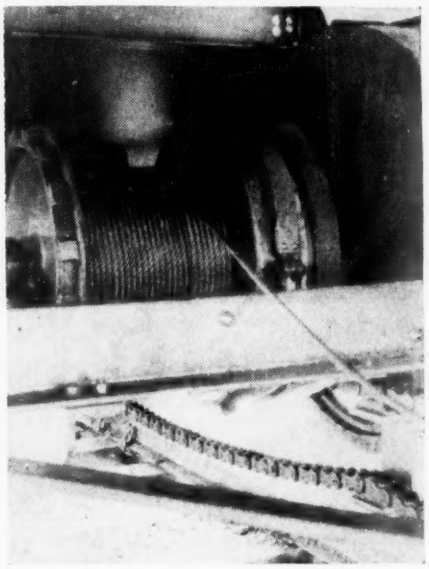
Over-all length of the dump, including the ramp, is 48 ft. The latter, which is 28 ft. long, is hinge supported at the upper end at a point on the machine 4 ft. ahead of the rear axle. Two 15-in. I-beams 25 ft. long constitute the side members of the main frame. The material being dumped is deposited 10 ft. ahead of the front axle. The "cab," which is built of sheet steel, consists of a back wall and narrow roof to serve as wind break and shelter.

Width of the platform is 13 ft. which provides 3 ft. of clearance on each side of the mine car. Controls, including motor pushbuttons, hand wheel, pedal and levers for the hoist friction, are grouped on or close to the cab wall. A pipe railing around the platform and an easy-grade stairway with railing are safety features.

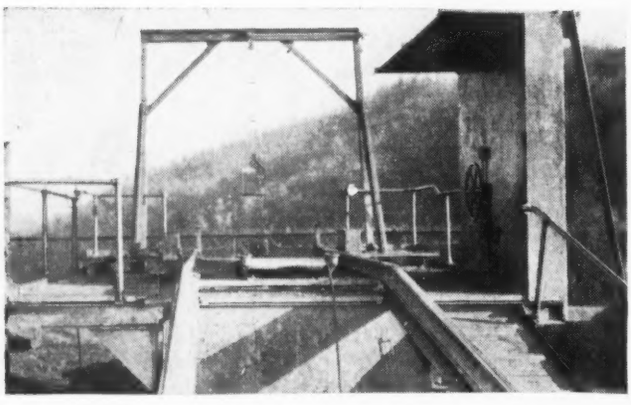
The hoist is equipped with ½-in. rope. Loads of mine rock average about 5½ tons. The horn dump latches in level position



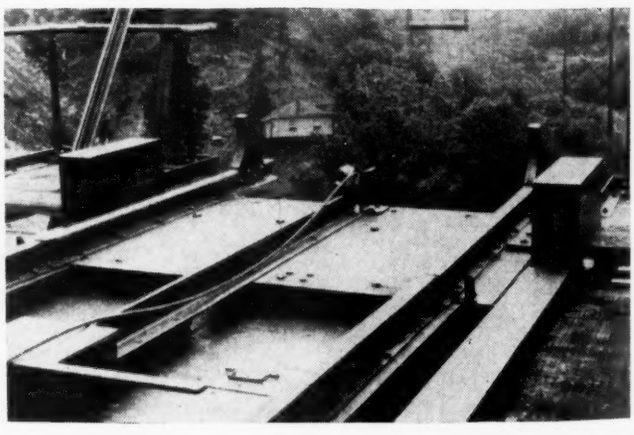
Platform width is 13 ft. Controls are on the wall of the open "cab" at the right. The head frame supports an endgate lifter.



The car hoist is mounted under the platform. While dumping a trip the hoist motor is left running and the hoist is controlled by a friction clutch. The roller chain connects the truck axles.



Including the hinged ramp, total dump length is 48 ft. The wheel base is 14 ft. and standard railroad car wheels are used.



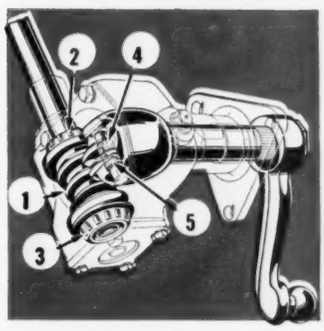
The upper head sheave is mounted on the front of the horn dump.

REGISTRATIONS *SHOW* IT — OPERATORS *KNOW* IT!

"FORD TRUCKS LAST LONGER!"

ONE big reason— FORD STEERING STANDS UP!

Ford worm-and-roller steering gear reduces *rubbing* friction to a minimum. *Rolling contact* is employed to reduce friction at five vital points. This spares muscle and saves wear. The worm gear (1) is straddle-mounted on two large, opposed, tapered roller bearings (2 and 3). The worm acts upon an easy-turning roller instead of a common sliding cam or split-nut, and this roller is mounted on two needle-type roller bearings (4 and 5). Bearings of both the worm and the sector shafts may be adjusted, thus promoting long life and proper action with less replacing of parts.



Ford

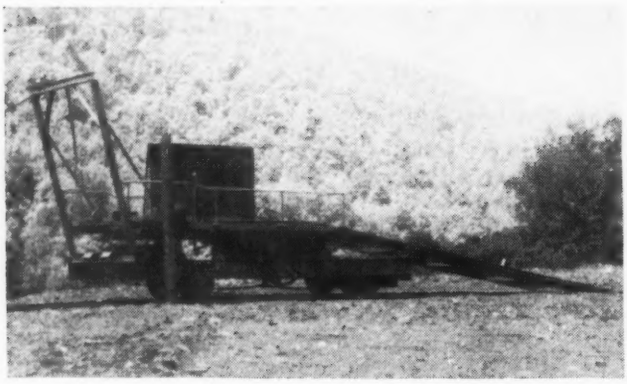
The Ford heavy duty 2-ton chassis of conventional type, as shown, or the extra-compact Cab-Over-Engine type, features a 2-speed axle and auxiliary springs. The High-Lift Hoist-Dump body is by General Body & Hoist Co., Everett, Massachusetts.

THE 6 YOUR PICK OF POWER THE V-8

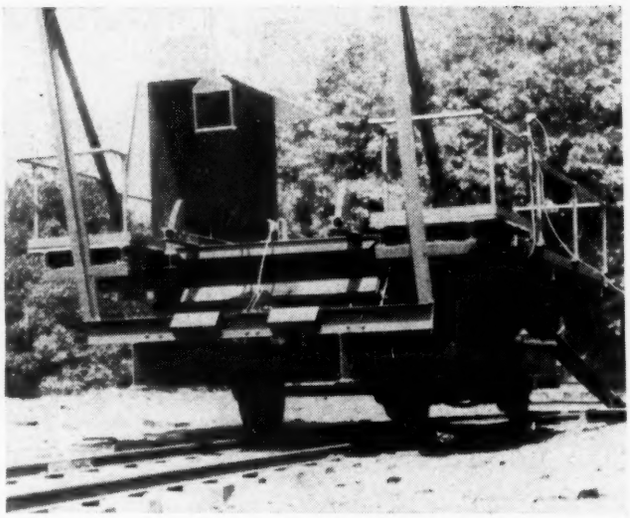
ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Your choice of two great engines, the V-8 or the Six—semi-centrifugal clutch that needs no maintenance lubrication—rear axle design that takes all weight-load off the shafts (¾-floating in half ton units, full-floating in all others)—heavy channel section frames, *doubled* between springs in heavy duty models—big, easy-action brakes, with heavy, cast drum surfaces, non-warping and score-resistant—extra-thick sheet metal in cabs, cowls, skirts and fenders—all told, more than fifty such examples of Ford endurance-engineering.

That's why FORD TRUCKS LAST LONGER . . . why, as the national truck count for 1946 just released shows, *more than half of all Ford Trucks in use are at least 9 years old* . . . why there are more Ford Trucks in service now than ever before in history. More than 100 body-chassis combinations to choose from. Ask your Ford Dealer.

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE



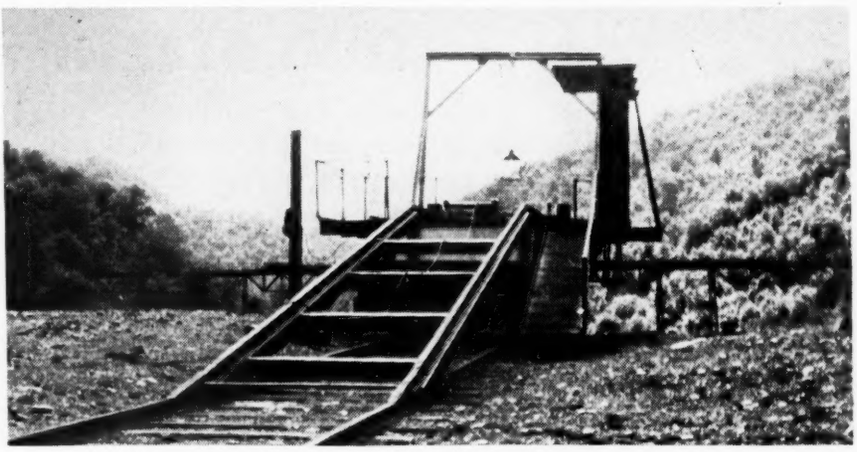
Showing the angle of the head frame which supports the end-gate lifter. Here the dumper has been moved back from its normal position at the edge of the fill.



At right. Front end showing two head sheaves.

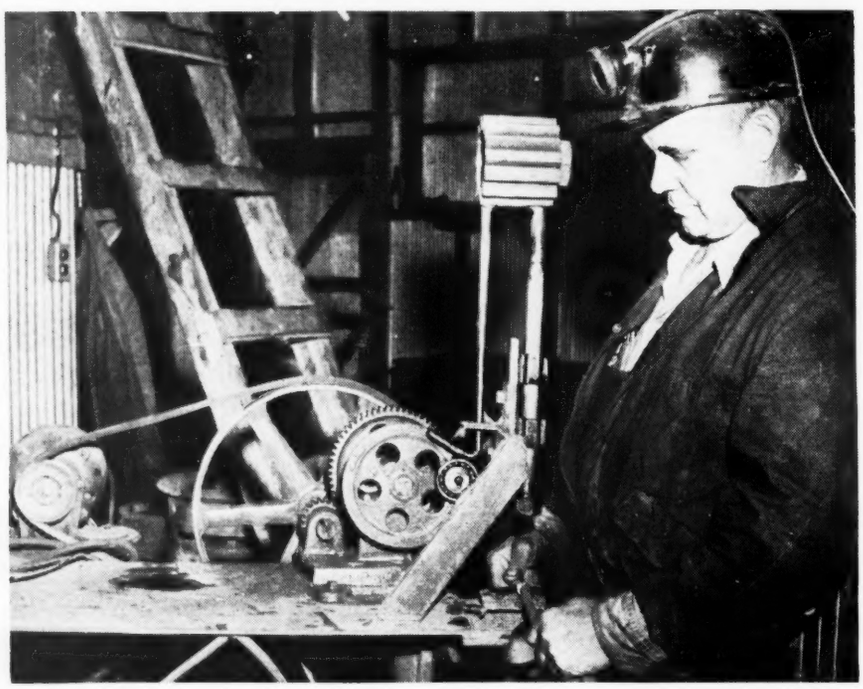
so that the downward component of the rope pull over the head sheave will not cause tipping before the car is against the horns. This latch is released by a foot pedal. Another latch on the sword locks the car in full dumping position, thus affording an opportunity to clean out the car if necessary. The one foot pedal has the combination duty of tripping both latches.

A triple reduction train of spur gears in an oil-tight case connects the 5-hp. traction motor to one axle and a roller chain connects the two axles. This motor and a 20-hp. unit on the hoist are magnetically controlled. A thorough job of painting the whole machine, including the under side, to prevent rust put the finishing touch on a job of fine workmanship.



Rise of the ramp is 6 ft. Track gage is 56½ in.

Small Trip Hammer Applies Cable Splicers



E. F. Brown uses two hands to hold the cables and splicing sleeve in proper position on the grooved anvil while he presses a treadle to start the electric hammer.

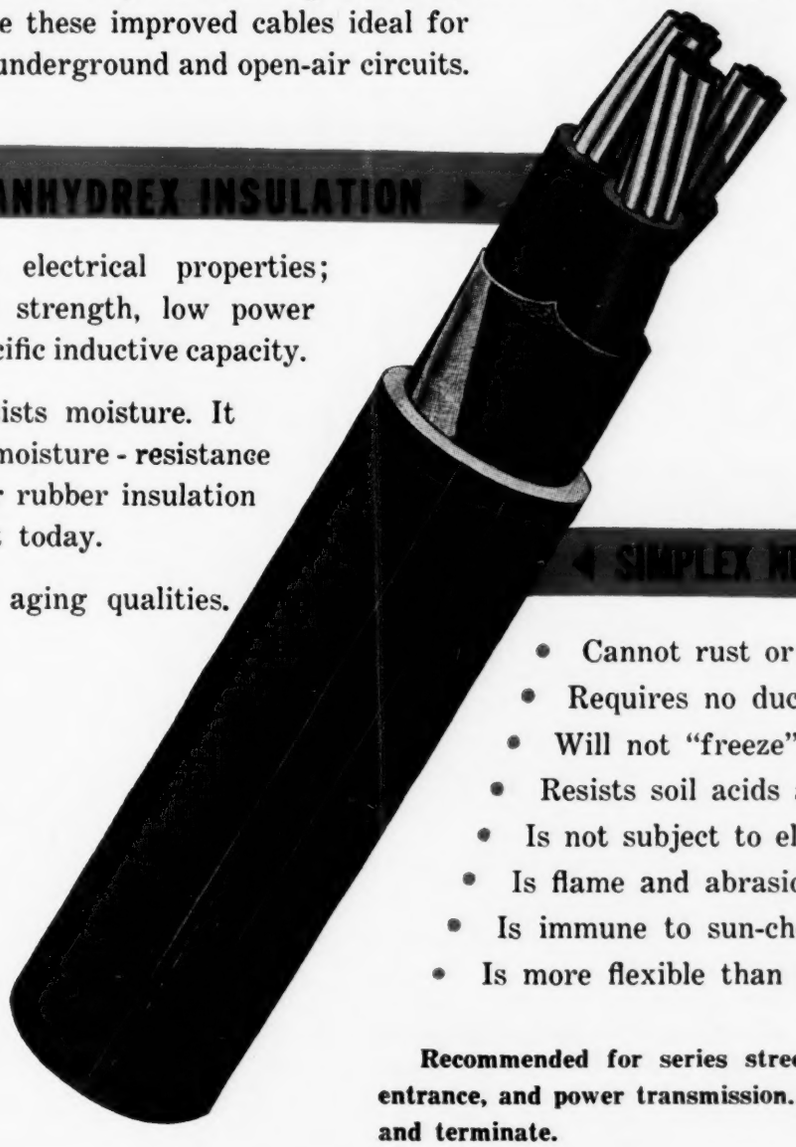
THREE HANDS would be a convenience and a safety measure in applying split corrugated sleeves to make splices in stranded conductors, such as trailing cables. That third hand has been supplied by E. F. Brown, chief electrician, Gay Coal & Coke Co., Mt. Gay, Logan County, W. Va., in the form of a small power hammer. This machine, assembled with a 1/6-hp. motor and a few knick-knacks and scraps, is mounted permanently on a small steel table in the shop near the mine portal and headhouse.

A locomotive pinion from the scrap pile constitutes the weight and cross member from the hammer plunger to the connecting rod. The crank pin is a ball bearing whose outer race rolls along the sloping base of the connecting rod as it raises the hammer. The latter drops as the ball bearing moves beyond the end.

Avoidance of bruised fingers is the principal advantage of the hammer. Another is that better splices are likely to be made.

Simplex adds Neoprene Jackets to Anhydrex Underground Cables

A NEW JACKET of tough neoprene now protects all ANHYDREX Underground Cables. Its many outstanding features, combined with those of the Anhydrex insulation, make these improved cables ideal for service in both underground and open-air circuits.



SIMPLEX ANHYDREX INSULATION

- Has excellent electrical properties; High dieletric strength, low power factor, low specific inductive capacity.
- Effectively resists moisture. It has greater moisture-resistance than any other rubber insulation on the market today.
- Has excellent aging qualities.

SIMPLEX NEOPRENE JACKET

- Cannot rust or rot.
- Requires no duct lubricants.
- Will not "freeze" to ducts.
- Resists soil acids and oils.
- Is not subject to electrolysis.
- Is flame and abrasion resistant.
- Is immune to sun-checks and cracks.
- Is more flexible than metallic sheaths.

Recommended for series street lighting, service entrance, and power transmission. Easy to tap, joint, and terminate.

May be installed with or without ducts.

Simplex

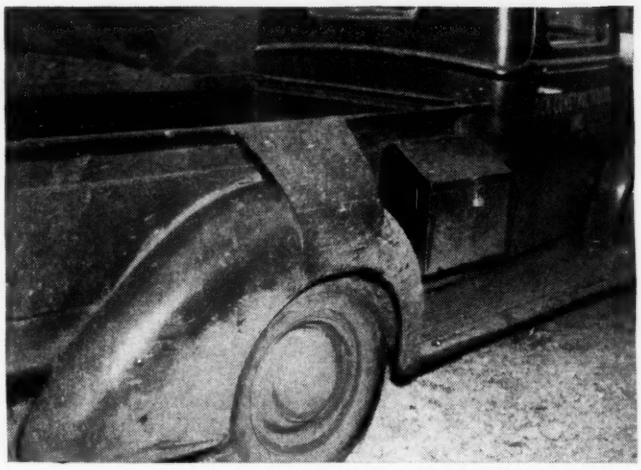
WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

Welded Brace Helps Support Fender

A SHEET-TYPE BRACE or sling is extending the life of truck fenders at the Trevorton stripping of the Dick Construction Co., Inc., Trevorton, Zerbe Township, Northumberland County, Pa.

The brace, shown in the accompanying illustration, helps combat wear and tear that fenders are subjected to while cruising over the strip mine roads. The braces were fashioned from 16-gage mild-steel sheeting and are arc-welded in place under tension. The sloping flange which overhangs the bed of the truck provides a good place to anchor this type of support for the rear fender.

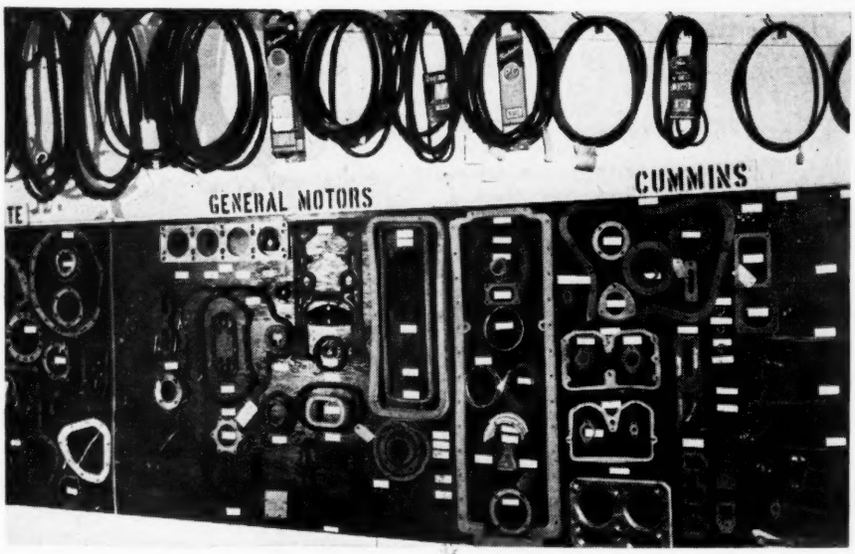


A brace which can be easily fashioned and quickly welded in place prolongs the life of the fender.

Gaskets Are Best Racked on Wall

GASKETS retain their shape better and are easier to store and dispense from nail hooks, says Edward Wilson, storekeeper, Little Sister mine, Little Sister Coal Corp., St. David, Fulton County, Ill. As shown in the accompanying illustrations the gaskets, for various makes of engines, are held practically flat against the wall and in their true shape by numerous nail hooks. Here, they remain dry and quite clean. Using a sufficient number of hooks for each item makes it easier to take off the outer gasket without disturbing or knocking down the remaining ones in the group.

The gaskets are grouped according to make of engine and clearly tagged with the proper nomenclature. Displaying the gaskets in this manner helps speed up the identification of the part being sought.

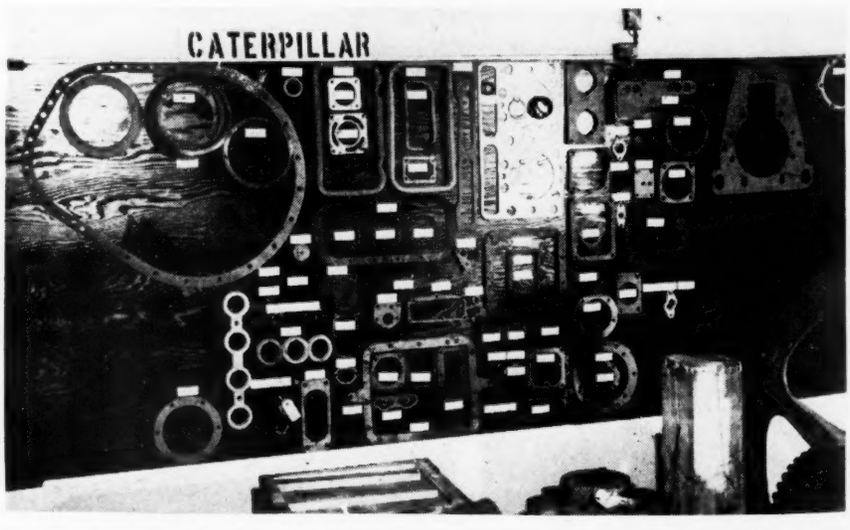


Fan belts and V-belts graded to length on this sloping rack present a picture of good housekeeping.

It is easy to identify the gaskets when they are stored in this manner.

Operating Oil

Operating ideas are as important to a mine as oil is to a bearing. It takes plenty of both to keep the modern plant running. That's why we feel your operation can make a worthwhile contribution to mining progress by submitting a mechanical, electrical, operating or safety idea already in use. It will help the other fellow and it is easy to do. Send a sketch or photo and a short description. If accepted, Coal Age, upon publication, will pay $5 or more each.



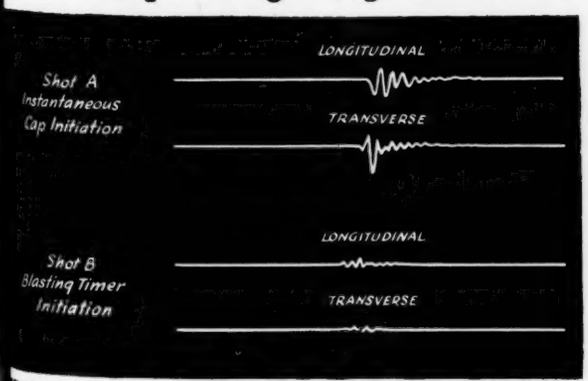
ANNOUNCING...

DU PONT BLASTING TIMER

Another Development of Du Pont Explosives Research and Technical Service

A SAFER
AND MORE EFFICIENT METHOD OF—

- *Reducing Vibration*
- *Improving Fragmentation*



SEISMOGRAPH RECORDS—Typical of similar blasts made (A) with, (B) without, the Blasting Timer.

THE Du Pont Blasting Timer introduces a new and improved method of providing short period delay blasting. Designed primarily for stripping and quarry operations, it embodies greater flexibility—permits broader application than any other known means.

It offers a wide choice of delay intervals—all precisely controlled—ranging from .010 second to .040 second—and *four* to *seven* circuits (periods) at each interval.

High degree of selectivity to suit individual blasting conditions allows continued use of Primacord initiated *above ground* by attaching instantaneous electric caps which are fired in proper sequences by the Timer. Power is applied with a conventional switch located at a safe distance.

Results: Greater reduction in vibration than is possible by any other method—usually accompanied by marked improvement in fragmentation—less back break in multiple row blasts.

Ask your Du Pont Explosives Representative for complete information, or write—E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT BLASTING TIMER

A Product of Du Pont Explosives Research

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING

Outside Spot Lamp Makes Locomotive Headlight

Effective, simple and low-cost locomotive headlight.

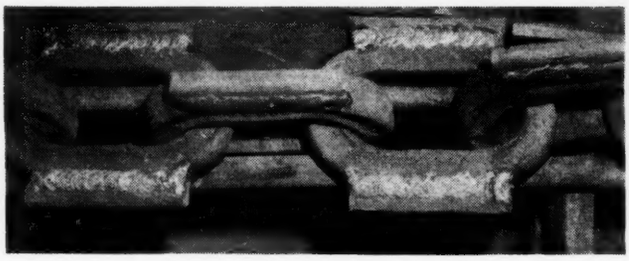
SEALED-BEAM LAMP BULBS intended for outside spots have been found strong enough for use as headlights on mine locomotives without the protection of a metal case or cage. At least, they are so used by the Gay Coal & Coke Co., Mt. Gay, Logan County, W. Va.

A stout steel shell containing the socket is brazed to the top of a compression-type spring 4 in. long, 2½ in. in diameter and made of $\frac{3}{16}$-in. steel rod. The bottom of this spring is brazed to a plate fastened to the top of the locomotive bumper. Two arms or straps of $\frac{3}{16}$x1-in. soft steel hold the lamp from jarring loose in the socket. Outer ends of the straps are bent over to hook over the front end of the lamp. The lower strap is brazed to the bottom of the socket shell. The top strap is fastened by a cap screw which, when tightened, holds the lamp rigid with respect to the socket shell.

The lamp used is the Type PAR 38 projector spot rated 120 volts 150 watts. Its Pyrex glass makes the lamp immune to heat and cold breakage from underground drips or rain encountered between the portal and headhouse.

Wearing Strips Extend Life of Drag Chains

How the chain wears when wearing strips are not applied.

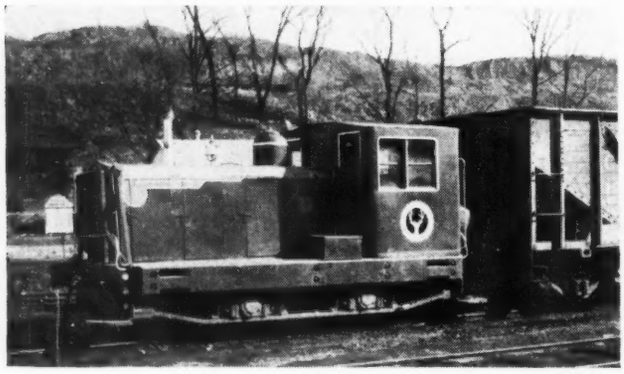


How the chain appears after wearing strips have been added

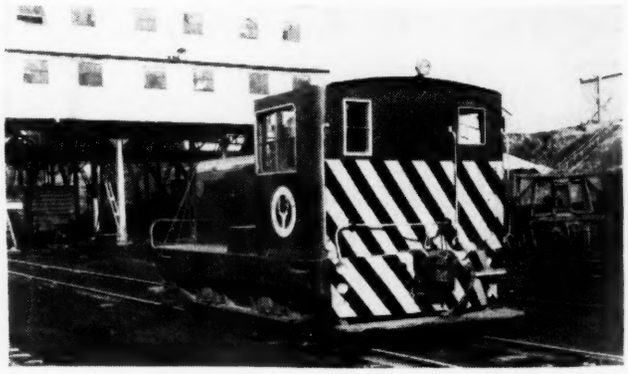
WEARING STRIPS welded on the sides of the links lengthen the service life of drag chains on draglines at the Trevorton stripping of the Dick Construction Co., Inc., Trevorton, Zerbe Township, Northumberland County, Pa.

The drag chains, shown in the accompanying illustrations, are installed on a 2½-yd. Type 120-B Bucyrus-Erie dragline. To make the chain last longer two 6-in. long 1-in. diameter rods are welded on the sides of each link. Most of the wear occurs on the sides of the link and is due to the chain coming in contact with abrasive material, especially standstone. For the material, 1-in.-diameter builder's round steel reinforcing rods are cut in 6-in. lengths. Being of mild steel, these pieces are easily welded to the links of the chain. These wearing strips may be replaced a number of times or until the end-wear of the links is critical.

Drive Replacement Improves Yard Switcher



The fluid drive has proven a pertinent factor in smoothing car handling.



The yard switcher is provided with the conventional safety markings.

EXCHANGING the gasoline engine and mechanical clutch in a 25-ton Plymouth yard locomotive for a 200-hp. Cummins diesel unit with a fluid drive, made by the American Blower Co., has improved the locomotive's performance and increased its year-round availability, declares E. B. Campbell, superintendent, Buckheart Mine No. 17, The United Electric Coal Cos., Canton, Ill.

The locomotive, shown in the accompanying illustrations, was out of service much too frequently because of clutch trouble. When the mechanical clutch was exchanged for a fluid drive, a 200-hp. Cummins diesel unit replaced the 150-hp. gasoline engine. In addition to the over-all mechanical improvement, including faster acceleration and the elimination of mechanical shock because of the fluid drive, fuel savings have resulted.

CINCINNATI MINE PUTS THE FINGER ON CUTTING PROBLEMS

FOR over twenty-five years we have made a study of cutting problems and have engineered and developed the finest in cutter chains, bits and bars. The Cincinnati Duplex Chain as well as the Cincinnati Standard Chain is engineered to give maximum efficiency throughout its long life. These chains are constructed to place the stress and wear on easily replaceable long life parts to provide trouble free service. Bit setting and bit hauling time on Mine Sharpened Bits has also been greatly reduced by two types of double-ended, reversible bits . . . the Duplex and the Stanex . . . both are tops for their specific use. Cincinnati Coal Cutting equipment helps you put the finger on cutting problems.

THE CINCINNATI MINE MACHINERY CO.

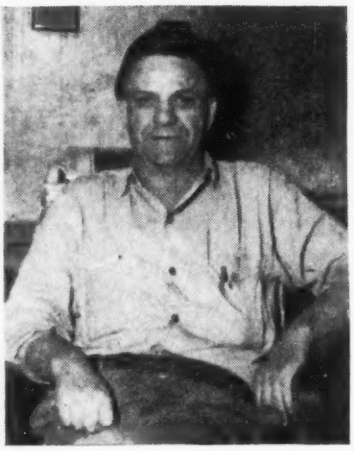
2983 SPRING GROVE AVENUE • CINCINNATI, OHIO

COAL MEN

Richard T. Todhunter Jr. (left), general manager, and Richard T. Todhunter Sr., president, Barnes & Tucker Co., Barnesboro, Pa.

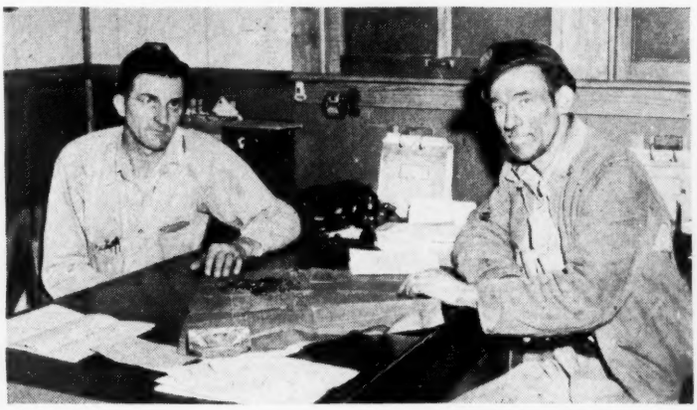
E. B. Jolly, chemist, Isabella mine, Weirton Coal Co., Isabella, Pa.

L. H. Honaker, tipple foreman, Gay Coal & Coke Co., Mt. Gay, W. Va.



W. D. Heller, master mechanic, Isabella mine, Weirton Coal Co., Isabella, Pa.

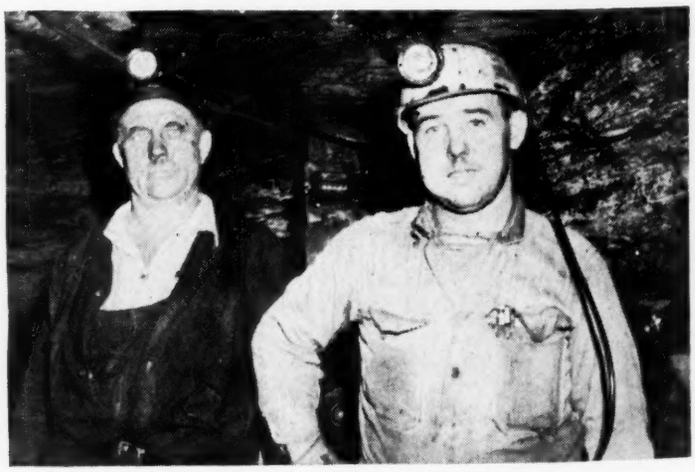
Robert Farino (left), assistant mine foreman, and H. C. Caldwell, general mine foreman, Lancashire No. 15 mine, Barnes & Tucker Co., Bakerton, Pa.



F. E. Vincent (left), superintendent, Gay Mining Co., Gilbert, W. Va., and W. L. Phillips, foreman, Mine No. 2.

Left—Moss Browning, general mine foreman, No. 3 mine, Gay Coal & Coke Co., Mt. Gay, W. Va.

T. C. Price, superintendent, Hazleton Shaft colliery, Lehigh Valley Coal Co., Hazleton, Pa.

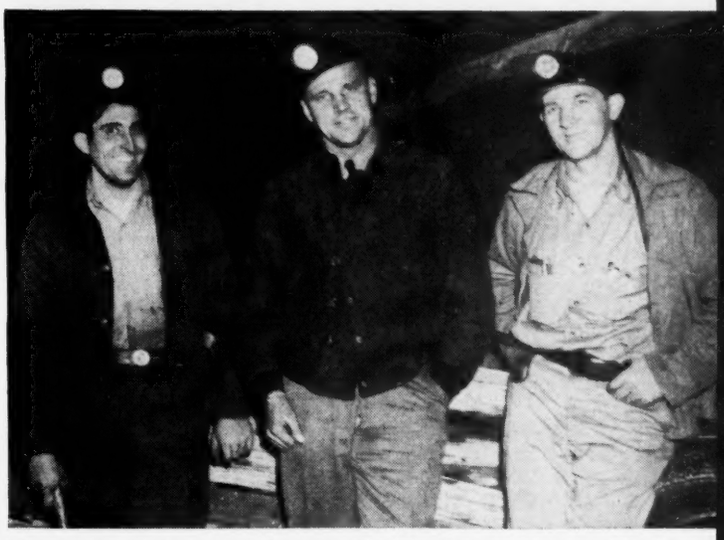


E. F. Brown (left), chief electrician, and E. T. Kitchen, section foreman, Gay Coal & Coke Co., Mt. Gay, W. Va.

ON THE JOB

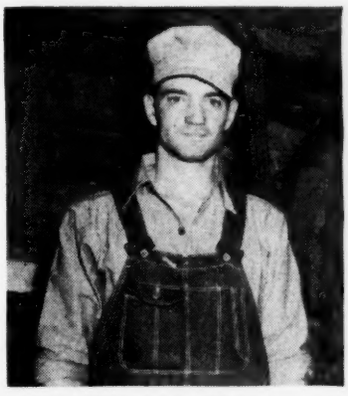
A. J. Jenkins, superintendent, Gay Coal & Coke Co., Mt. Gay, W. Va.

George Dunchuck (left), general superintendent, and James Nicholson, safety engineer, Barnes & Tucker Co., Barnesboro, Pa.



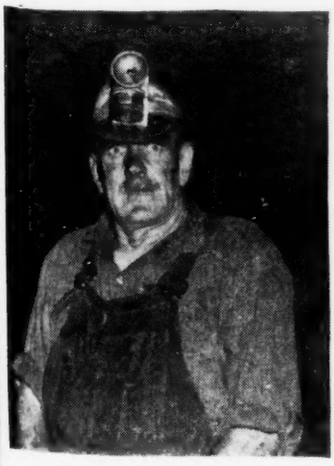
Alex Stanley (left), section foreman, J. L. Shroder, production and safety engineer, and James Dove, general mine foreman, Gay Mining Co., Gilbert, W. Va.

Roy R. Brown, superintendent, Maiden mine, Kelley's Creek Colliery Co., Morgantown, W. Va.

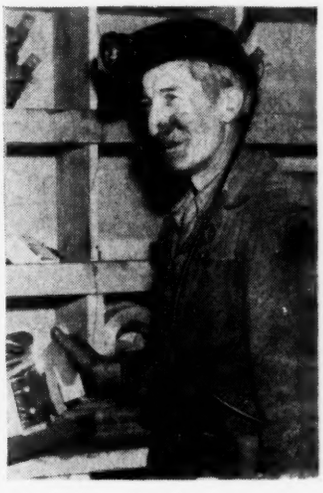


L. H. Mallett, partner, Centerville Coal Co., Centerville, Iowa.

Charles Ragona, partner, Ragona Coal Co., Centerville, Iowa.

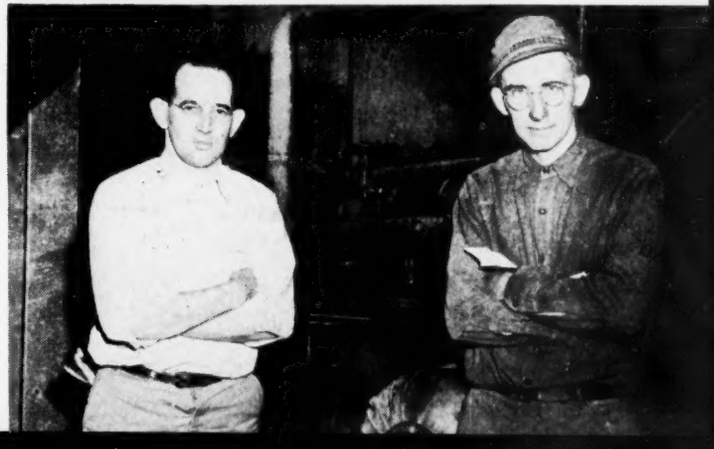


William Jones, foreman, No. 3 mine, Sunshine Coal Co., Centerville, Iowa.



Freeland Esteppe, chief electrician, Gay Mining Co., Gilbert, W. Va.

C. S. Henderson (left), supply man, and Ross Stevens, preparation plant foreman, Red Ember mine, Truax-Traer Coal Co., Fiatt, Ill.



Thermoid – for Progress in Industry

In 1903, pipe-fed air drills like these weighed from 300 to 1500 pounds and struck from 250 to 400 blows a minute.

Today modern hose-fed jack hammers weigh only 30 to 72 pounds and strike 1800 blows per minute.

THINK of the time saved by mobility of equipment afforded by flexible, tough, abrasion-resistant Thermoid air hose over clumsy, slowly moved metal pipes.

What better picture can we give you of how Thermoid research and industrial rubber knowledge have contributed to "Progress in Industry."

Whether you operate a quarry, mine, creamery or brewery . . . are in agriculture, construction, oil or any manufacturing industry, consult your local Thermoid Jobber or direct factory representative on all problems relating to hose, belting or friction materials. When you do, you'll find—"It's Good Business to do Business with Thermoid."

THE THERMOID LINE INCLUDES: Industrial Brake Linings and Friction Products • Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose.

Thermoid

THERMOID COMPANY

Trenton, New Jersey

Contributor to Industrial Advancement Since 1880

News Round-Up

New Contract Negotiations Delayed As Congress Studies Labor Measures

EARLY MARCH found the sands of time rapidly running out for the successful conclusion of an operator-union agreement in advance of John L. Lewis' deadline of March 31, as the Supreme Court continued to hold under advisement the Lewis-U.M.W. contempt case. Admittedly, both parties are awaiting the Court's decision, while hoping that early crystallization of Congressional labor legislation would provide the much-needed guideposts under which a new wage agreement could be made. Although some informal and unofficial discussions between union officials and individual operators were understood to have taken place recently, officially neither group, nor the Government, had moved a step toward the opening of negotiations.

Meanwhile, the Government's postwar role in the coal industry was another question reportedly receiving considerable attention from both Government officials and mining executives, with the basic issue whether there was need for some replacement of the Guffey Coal Act type of price-and-production regulation. Admittedly, the need is not now apparent—nor is it expected to become so in the near future since coal is still long in demand in relation to its economic production potential.

But whatever the future, present thinking is spurred by two impending "deadlines" affecting the Government's place in the industry—expiration of the Second War Powers Act, meaning the end of the Solid Fuels Administration March 31, and President Truman's declaration of the end of hostilities, which ends the Coal Mines Administration June 30. Expiration of these two agencies leaves the Government completely without regulatory jurisdiction over coal for the first time since the enactment of the Guffey Act during the depression.

Initiative on the subject is reportedly coming from Secretary of Interior Krug. So far, he and his staff are simply looking into the problem and "talking it over" with some mining men, but their ideas are expected to be brought out into the open in a month or so.

The first of the three alternatives that appear possible is for Krug to set up, by secretarial order, a coal division in the Interior Department—comparable to the Power Division and the Oil and Gas Division—as a sort of interim activity to bridge the gap between wartime controls and some not yet developed "permanent" Government jurisdiction over the industry. A second method would be the establishment of a "big name" coal investigating committee—such as the old Hammond Committee—to develop and sponsor a national policy for coal, reporting to President Truman and Congress.

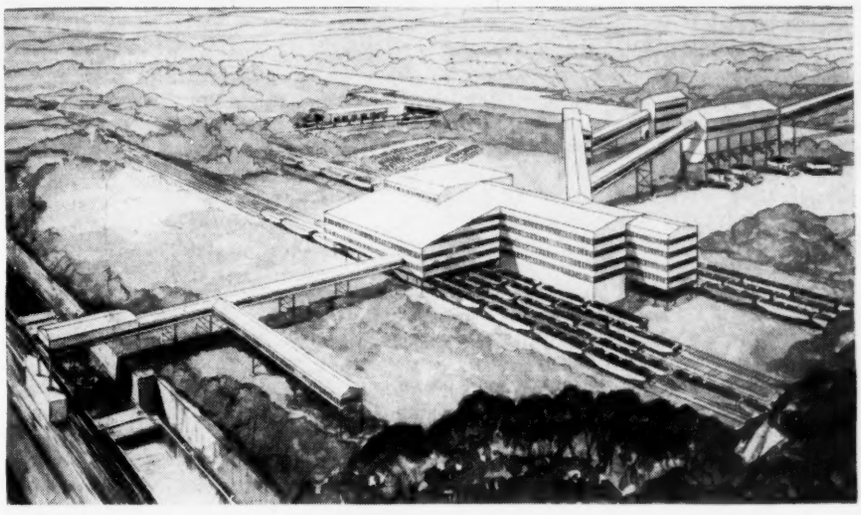
As a third course, Krug may possibly seek to interest Congress and urge a long-range committee study similar to what an independent commission might undertake, with the objective being the development on a bipartisan basis of a national policy to be incorporated into legislation to replace the Guffey Act.

Hearings on proposed labor legislation continued throughout the month before the Senate Committee on Labor and Public Welfare, and the House Committee on Education and Labor opened similar hearings Feb. 3. Many industry representatives, including those of the coal industry, presented their views on the correction of labor excesses and the legislation needed, and were followed by prominent labor leaders, most of whom maintained that no restrictions or changes were necessary or advisable.

In an appearance before the Senate group Jan. 30, James D. Francis, president, Island Creek Coal Co., called for legislation to prohibit the discussion of welfare, health and retirement funds as a condition of collective bargaining. On the question of industry-wide bargaining, Mr. Francis supported a proposed bill that limits employee representation by a single bargaining unit to normal market areas. He asked that Congress define an employee to definitely exclude, in addition to foremen and supervisors, plant-protection, technical, professional and confidential workers.

On Feb. 11 and 12 Attorney Forney Johnston, representing the National Coal Association, appeared before both committees to urge, among other steps, that Congress by definitive laws remove the

Pittsburgh Consolidation Plans New Plant



Artist's drawing of a new coal cleaning and preparation plant to be erected at the Mathies mine. Monongahela, Pa., contracts for which were approved Feb. 17 by the board of directors of the Pittsburgh Consolidation Coal Co. Construction of the plant, which is part of a $4,000,000 surface development program at that mine, is to be started as soon as possible and a capacity of 7,000 tons daily is planned. Coal will be dumped onto a belt system at the mine portal (rear center) and carried underground to the main preparation plant, for wet cleaning. Prepared coal will be delivered to trucks, railroad cars, river barges and to the Mitchell power plant of the West Penn Power Co. to be erected near the river in front of the preparation plant. The modernization program at this mine, when completed, will represent an investment of $7,000,000. The mine has reserves for 40 to 50 years of operation.

compulsion now existing under present laws to include welfare, unionization of foremen and other matters as part of collective bargaining. While NCA expressed itself as not opposing welfare funds as such, it maintained that they and other questions not directly related to wages, hours or working conditions are not matters for collective bargaining as required by law but rather matters for voluntary action by unions and employers. Strikes on such questions, NCA said, should not have protection of federal laws not granted to all citizens.

The suggestion that no union be permitted to represent more than employees of one employer and that agreements between unions on demands to be made of employers be prohibited was offered by Rolla D. Campbell, general counsel, Island Creek Coal Co. and Pond Creek Pocahontas Co., before the House committee Feb. 17. He also urged that the Wagner Act be amended so that it would not be unlawful for an employer to refuse to bargain on welfare and related subjects, as is now required under the law.

Gwynne Bill Hearings

House Judiciary Committee hearings on the Gwynne bill ended Feb. 10. Both the National Coal Association and the American Mining Congress presented the views of the mining industry during the sessions. The bill was expected to reach the House floor shortly and in its latest form called for a one-year statute of limitation on suits under the Wage-Hour laws, protection of employers who act in good faith under rulings and interpretations of the Wage-Hour Division and permission to settle claims under the Wage-Hour Act. The Senate Judiciary Committee also had a measure under consideration.

In a Wheeling, W. Va., Federal court, the suit by Ralph A. Fox, who was ousted as manager of his coal-mine properties by the Coal Mines Administration, was heard Feb. 19. In asking for an order restraining the CMA, Fox, through counsel, maintained that the agreement between the Government and U.M.W. deprived him of his property without due process of law. The court took the case under advisement for a ruling later.

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Oil From Coal Cost Lowered by Research

As a result of recent new research developments, the estimated cost of producing gasoline from coal or oil shale is now 7½ to 9½c. per gallon, only a few cents higher than the present cost of gasoline from petroleum and considerably lower than anticipated, according to Secretary of Interior Krug's annual report to Congress submitted last month.

"At the present rate of research progress, production of synthetic petroleum products on a commercial basis is possible within a few years," Dr. R. R. Sayers, Director, U. S. Bureau of Mines, said, in commenting on the report which outlined the work being carried on at the several experiment stations under his direction.

Coal Activity

Bituminous Coal Stocks

	Thousands Net Tons Jan 1, 1947	P.c. change From Dec. 1, 1946	P.c. change From Jan 1, 1946
Electric power utilities	13,044	−10.3	−11.0
Byproduct coke ovens	5,222	−17.8	+8.7
Steel and rolling mills	750	−14.5	+26.2
Railroads (Class I)	6,959	−8.3	−22.5
Other industrials*	18,443	−9.0	+37.6
Retail dealers	2,704	−6.2	−15.8
Total	47,122	−10.1	+3.2

Bituminous Coal Consumption

	Thousands Net Tons Dec., 1946	P.c. change From Nov., 1946	P.c. change From Dec., 1945
Electric power utilities	6,732	+4.4	+15.9
Byproduct coke ovens	6,714	−4.0	−8.4
Steel and rolling mills	857	+7.3	−7.0
Railroads (Class I)	9,515	+7.2	−13.4
Other industrials*	13,402	+9.1	+0.1
Retail dealer deliveries	8,659	−5.0	−34.5
Total	45,879	+3.1	−11.2

* Includes beehive coke ovens, manufactured-gas plants and cement mills.

Bituminous Production

January, 1947, net tons	58,860,000
P.c. change from Dec., 1946	+39.0
P.c. change from Jan., 1946	+8.8

Anthracite Production

January, 1947, net tons	5,157,000
P.c. change from Dec., 1946	+1.5
P.c. change from Jan., 1946	+3.5

Index of Business Activity*

Week ended Feb. 22	190.3
Month earlier	189.9
Year earlier	150.7

* *Business Week, Mar. 1.*

Electric Power Output†

Week ended Feb. 22, kw.-hr	4,777,740,000
P.c. change from month earlier	−1.6
P.c. change from year earlier	+21.8

† Edison Electric Institute.

New Developments

• The Juliette Coal Co., with headquarters in the Grant Bldg., Pittsburgh, and extensive stripping operations in Ohio and Pennsylvania, is reported to have recently opened the Rush Meadow strip mine near Whitby, Raleigh County, W. Va. The new operation is on the Virginia Ry. and a capacity of 1,000 tons daily is planned.

The company's Corky strip mine in Somerset County, Pennsylvania, reportedly will be developed into a drift mine. The operation is to be completely mechanized, with a capacity of 1,500 tons daily.

• The Bird Coal Co., Johnstown, Pa., is reported to have leased from the Carnegie-Illinois Steel Corp. the B seam in the Ingleside No. 5 mine at Riverside, Pa. The mine, which was last operated by the Stineman Coal & Coke Corp., will be known as the Bird No. 3 mine.

• The Rough River Coal Co., Madisonville, Ky., recently incorporated by W. C. Parrott, R. O. Park and L. R. Kelce, is reportedly planning to open a new strip mine Sept. 1. The West Kentucky No. 9 seam is to be mined and the operation will ship via the Louisville & Nashville R.R. A new McNally-Pittsburg tipple and washery will be built, with a capacity of 350 t.p.h.

• B. Perini & Sons, Inc., Somerset, Pa., has opened a new strip mine at Elda, W. Va., on the Norfolk & Western Ry. George D. Phillips, Somerset, Pa., is general manager of the company, and Albert L. Cummings, Thacker, W. Va., is superintendent in charge of the new operation.

• The Central States Construction Co., Logan, Ohio, is reported to have opened a new mine near Orlando, from which it expects to soon begin rail shipment of coal. The company also is said to be opening a truck strip mine near Ilesboro, with a capacity of 200 to 300 tons daily.

• The Peabody Coal Co. last month took an option on the mine of the old Penwell Coal Co., near Pana, Ohio, effective until March 1, and company officials were reportedly inspecting the property. The mine, now owned by the Southern Coal Co., has been out of operation for some time.

• Purchase of the Douglas Pocahontas Coal Co., with a mine at Iaeger, W. Va., by Norman N. Lee, owner of the Independent Operators' Sales Co., Arlington, Va., and president of the Atlantic Smokeless Coal Co., was recently announced. The mine, operating in the Red Ash seam, is a modern mine producing 200 tons a day and Mr. Lee expects to double that tonnage within the next few months.

• Two railroad extensions, one by the Louisville & Nashville R.R. and the other by the Chesapeake & Ohio Ry., were approved by the Interstate Commerce Commission Jan. 30. Both will serve undeveloped coal areas in the Elkhorn district of eastern Kentucky.

New construction by the L. & N. will extend 16.7 miles from near Blackey, Ky. up Rockhouse Creek to Deane, Ky., near the mouth of Mill Creek. The new C. & O. line will run 25 miles from Wayland, Ky., up Beaver Creek through Beaver Gap, down Mill Creek and up Indian Creek, terminating near the headwaters of Indian Creek. Contracts for both projects are expected to be awarded shortly.

• The Winding Gulf Collieries Co., Bluefield, W. Va., announced Feb. 13 the purchase for $100,000 of the mineral rights to 606.78 acres of land containing the Pocahontas Nos. 3 and 4 seams, located at the head of Winding Gulf in the Slab Fork district of Raleigh County. Frank Smith, chief engineer, stated that the coal would be held as a reserve, explaining that the company already owned the surface rights and that the Beckley seam underlying it had already been mined.

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Coal Crisis Forces British Power Cut

Great Britain hovered on the brink of industrial and economic chaos last month as an unprecedented cold wave accompanied by heavy snows throttled rail and shipping facilities, cut mine output and reduced coal stocks to a dangerous minimum. To save coal, the Government rationed domestic use of electricity and

Lewis Loses in Supreme Court

BY A MAJORITY of 7 to 2, the Supreme Court March 6 upheld the Dec. 3 decision of Judge Goldsborough, of the U. S. District Court for the District of Columbia, that both John L. Lewis and the United Mine Workers were guilty of civil and criminal contempt for refusal to suspend the Nov. 15 notice of last year terminating the Krug-Lewis agreement Nov. 20. The court, however, reduced the fine on the union from $3,500,000 to $700,000, provided it conforms to the "mandate" of the court within five days after its issuance. Such mandates usually are issued 25 days after the decisions. The court sustained the personal fine of $10,000 against Lewis.

Since contempt was the issue before the Supreme Court, there was no finding on whether Lewis and the union could terminate the Krug-Lewis agreement on 30 days' notice. Trial of this issue in Judge Goldsborough's court was postponed pending the contempt decision. Government attorneys were reported studying the situation to see what their next move would be.

While the Supreme Court mustered a sizeable majority in favor of upholding the contempt conviction, there was less agreement on various other points. The justices stood on some of these as follows:

Vinson, Reed, Burton, Black and Douglas – The provisions of the Norris-La Guardia and other acts do not bar the government from resorting to the injunctive process in labor disputes when it is the employer.

Frankfurter, Jackson, Rutledge and Murphy – The government is subject to acts governing injunctions in labor disputes.

Murphy – Seizure was not government operation and consequently the government had no power to seek an injunction.

Black and Douglas – The fines approved by the majority were excessive; should be assessed only if Lewis and the union failed to comply with court mandate.

Court Orders Paramount

The majority of seven, while differing on the applicability of the Norris-La Guardia and other acts governing injunctions in labor disputes, agreed in upholding the principle that court orders must be obeyed pending determination of whether the court has jurisdiction, and that refusal warrants civil and criminal penalties. In his dissenting opinion, in which Justice Murphy concurred, Justice Rutledge declared that Congressional discussion and action clearly indicated that the policy of the Norris-La Guardia Act applied to the government and that, therefore, in accordance with precedent, refusal to obey the court involved neither civil nor criminal penalties. Justice Rutledge also sharply challenged procedure in the lower court

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JUDGMENT

LEWIS – Fine of $10,000 confirmed by Supreme Court.

U.M.W.—"Judgment against the defendant union is held to be excessive. It will be modified so as to require the defendant union to pay a fine of $700,000 and, further, to pay an additional fine of $2,800,000 unless the defendant union, within five days after the issuance of the mandate herein, shows that it has fully complied with the temporary order issued Nov. 18, 1946 and the preliminary injunction issued Dec. 4, 1946."

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and held that penalties were excessive and the method of apportioning them between the civil and criminal issues in error.

Five of the justices making up the majority flatly disagreed with the contention that Congressional debate and action, including that connected with the passage of the War Labor Disputes Act in 1943, indicated any restraint on the government. The justices cited, among other things supporting the opposite conclusion, the remarks of Rep. La Guardia when the bill bearing his name was up in 1932, as follows: "I do not see how in any possible way the United States can be brought in under the provisions of this bill."

Miners' Status Altered

Dealing at length with the question of whether miners became government employees, the majority held that seizure did act to put them in that relationship. Observing that the Krug-Lewis agreement was solely between the government and the union, that the private operators were not a party to it nor to any subsequent modifications, that the operators vigorously opposed many of its provisions and have yet to express their approval, that Lewis referred to the operators as "strangers to the Krug-Lewis agreement" and to the miners as "400,000 men who now serve the government of the United States in the bituminous coal mines," the majority of the justices held as follows:

"Under the conditions found by the President to exist, it would be difficult to conceive of a more vital and urgent function of the government than the seizure and operation of the bituminous coal mines. We hold that in a case such as this, where the government has seized actual possession of the mines, or other facilities, and is operating them, and the relationship between the government and the workers is that of employer and employee, the Norris-La Guardia Act does not apply."

Passing on to the subject of obedience of court orders, the majority held that it is mandatory, even where the right to issue is challenged, until the question of the court's jurisdiction is determined. "In the case before us, the district court had the power to preserve existing conditions while it was determining its own authority to grant injunctive relief. The defendants, in making their private determination of the law, acted at their peril. Their disobedience is punishable as criminal contempt . . . Violations of an order are punishable as criminal contempt even though the order is set aside on appeal . . . or though the basic action has become moot." Even if it had been found that the Norris-La Guardia Act applied, the majority said, only the preliminary injunction of Dec. 4 and judgment for civil contempt would have been set aside. "We would, subject to any infirmities in the contempt proceedings or in the fines imposed, affirm the judgments for criminal contempt as validly punishing violations of an order then outstanding and unreversed." The majority further held that the proceedings in the lower court supported judgments in both civil and criminal contempt.

Union Fine Reduced

The fine of $10,000 on Lewis was warranted, according to the majority, but it held the $3,500,000 penalty on the union "to be excessive." Consequently, the fine was cut to $700,000, with the remaining $2,800,000 to be paid if the union did not show within five days afterward that it had complied with the court's mandate. "The defendant union can effect full compliance only by withdrawing unconditionally the notice given by it, signed by John L. Lewis, president, to J. A. Krug, Secretary of the Interior, terminating the Krug-Lewis agreement as of 12 o'clock midnight, Wednesday, Nov. 20, 1946, and by notifying, at the same time, its members of such withdrawal in substantially the same manner as the members of the defendant union were notified of the notice to the Secretary of the Interior above-mentioned; and by withdrawing, and similarly instructing the members of the defendant union of the withdrawal, of any other notice to the effect that the Krug-Lewis agreement is not in full force and effect, until the final determination of the basic issues arising under the said agreement."

prohibited its use by all but essential industries. More than 5,000,000 workers were thrown out of jobs and it was thought that it would be months before the setback to Britain's already faltering production would be overcome. While at one point even the collapse of the Labor Government and its nationalization program seemed to be threatened, by the latter part of the month with easing of the weather and increasing coal production the country was starting back to normalcy.

The cut-off in industrial power, which began Feb. 10 for half the island, was later widened to include the entire country, with domestic users required to go without electricity from 9 to 12 a.m. and 2 to 4 p.m. daily under penalties of wartime regulations. At one time, coal stocks at all power stations amounted to only a nine-day supply, and by Feb. 17 had risen to only 10¾-days stock. Collieries worked Sunday, Feb. 16, in an emergency measure to build up tonnages. While lagging coal production caused by frozen machinery, absenteeism and the already recognized ills of Britain's coal industry was a factor in the situation, the greatest difficulty lay in the almost complete breakdown of transportation facilities. More than 2,500 ships were icebound, roads were almost impassable, railroads practically at a standstill and loading and unloading equipment almost useless. As a direct result of the loss of production, meeting Britain's 1947 export commitments was believed impossible, although a full analysis of the economic effects could not yet be obtained.

Limitations in gas consumption proposed toward the end of the month were put off by better weather.

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Alabama Mine Test Yields Gas From Coal

A gas that could be used in manufacturing synthetic liquid fuels has been successfully produced in the underground coal-gasification experiments being carried on by the Alabama Power Co. and the U. S. Bureau of Mines, Dr. R. R. Sayers, director, U. S. Bureau of Mines announced Feb. 18. No difficulty in maintaining combustion was encountered, he said.

Although steady combustion was maintained and most mechanical difficulties were eliminated during the first 16 days of the experiment, Dr. Sayers said, the resistance resulting from roof falls and other undetermined causes prevented an air flow sufficient to obtain the burning temperature and gas quality sought and a limited amount of oxygen was introduced to enrich the air. After the oxygen was exhausted, an air blast was coursed through the tunnel, resulting in a steady improvement in operating conditions and gas quality. A relatively high-grade synthesis gas also was produced by alternately blowing air and steam through the burning mine. While roof falls were thought to be as anticipated, cover will be removed by bulldozers and shovels for analysis and study. Further extensive research is required before the technical and economic practicability of the experiment can be definitely determined.

Red Jacket Holds Second Safety Dinner

"We don't want a single ton of coal that involves an accident," declared P. M. Ritter, president, Red Jacket Coal Corp., speaking at a banquet of the company's executives, officials and foremen at the West Virginian hotel, Bluefield, W. Va., Jan. 19. The 14 foremen whose men incurred no lost-time accidents during 1946 and who were honored at the meeting were: Wyoming mine, Carl Mace, Dale Browning, L. D. Browning, Floyd McCoy, E. M. Tolliver, T. D. Jordan, Grover Bradford, Laurence Vance, D. W. Halstead and Bob Shuler; Keen Mountain mine, Ivory Killen and W. O. Bohon; Coal Mountain No. 11 mine, John Fowler and W. M. Smith.

This was the second banquet held in January by the company and was attended by 160 men. The first, a week earlier at Williamson, W. Va., covered another group of the company's mines (February Coal Age, p. 130). C. P. Ferguson, safety director, read the names of the men of the crews working under those foremen who won the recognition.

J. W. Damron, chairman of the board, spoke briefly in appreciation of the improved safety record and A. U. Miller, supervising engineer, U. S. Bureau of Mines, Mt. Hope, W. Va., was the guest speaker. J. F. Maurice, chief engineer, acted as toastmaster and introduced a number of officials, including Wm. M. Ritter, assistant general manager, J. R. Kirby, general manager, A. J. Pugh, superintendent, Wyoming mine, Denver E. Damron, superintendent, Keen Mountain (Va.) mine,

Some of the Red Jacket executives and officials at Bluefield—seated, left to right, Arch J. Alexander, chief, West Virginia Department of Mines; D. E. Damron, chairman of the board; F. B. McChesney, treasurer; Wm. M. Ritter, assistant general manager; and W. D. Shelton, safety inspector; standing, C. M. Meadows, inspector-at-large, West Virginia Department of Mines; John Jones, superintendent, Coal Mountain mines; A. J. Pugh, superintendent, Wyoming mine; P. M. Farquharson, safety inspector; John Fowler, mine foreman, Coal Mountain mines; Denver E. Damron, superintendent, Keen Mountain (Va.) mine; and Roy Richardson, safety inspector.

Foremen of Wyoming, Keen Mountain and Coal Mountain No. 11 mines, Red Jacket Coal Corp., honored at the Bluefield banquet for "no lost-time accidents during 1946"—seated, left to right, Floyd McCoy, Carl Mace, Ivory Killen, W. O. Bohon and Robert Shuler; standing, E. M. Tolliver, T. D. Jordan, John Fowler, L. D. Browning, Dale Browning, Grover Bradford, W. M. Smith, D. W. Halstead and Lawrence Vance.

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Foremen Honored at First Red Jacket Dinner

In this photograph recently received, foremen who were honored for their safety records at the dinner held Jan. 12 by the Red Jacket Coal Corp. for supervisors of the company's mines near Red Jacket, W. Va., (*Coal Age*, February, p. 130), are—seated, left to right, D. E. Edmonds, D. B. Hammond and J. Carl Cook; standing, Okey Tiller, Fred Sears, Bill Ball, Haywood Dean, Ed. Blankenship, Wiley Hood and James Martin.

John Jones, superintendent, Coal Mountain mines; and J. J. Plasky, training director. He also introduced guests, as follows: Arch J. Alexander, chief, West Virginia Department of Mines, C. M. Meadows, inspector-at-large, West Virginia Department of Mines, and J. H. Edwards, associate editor, *Coal Age*.

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Big and Little Inch Sold for Gas Use

The War Assets Administration Feb. 14 accepted the $143,127,000 cash bid for the sale of the Big and Little Inch pipelines for the transmission of natural gas, submitted by the Texas Eastern Transmission Co., Houston, Texas. The bid, which was the highest of the six announced as "valid" Feb. 10, is subject to the approval of the Attorney General and the issuance of a certificate of necessity and convenience by the Federal Power Commission. The lines, reaching from Texas to New York, were built in wartime at a cost of $145,800,000 to bring oil to the eastern seaboard.

All but one of the acceptable bids called for the transport of gas exclusively. The exception was an offer of $121,000,000 by C. A. Williams & Associates, Austin, Texas, to operate the larger line for gas and the smaller one for petroleum. This same group, however, bid $131,000,000 for the right to send gas through both lines.

Texas Eastern Transmission Co. was formed in January, 1947, by E. Holley Poe, New York, president, and George R. Brown, Houston, Texas, board chairman. The company said it expects to raise most of its $182,000,000 capitalization from the sale of securities underwritten by Dillon, Read & Co., New York investment bankers.

Tennessee Gas & Transmission Co., present operators of the lines under an emergency agreement made with Secretary of the Interior Krug during the bituminous strike last November and December, offered $123,700,000 for the two lines. Other bids termed "valid" by the WAA were as follows: Big Inch Oil & Gas Corp., New York City, $108,031,660, both lines to carry natural gas; Big Inch Natural Gas Transmission Co., Washington, D. C., $121,000,000, both lines to carry natural gas.

The 30-day period provided in the Surplus Property Act, during which time Congress might have intervened in the proposals for sale of the Big Inch lines, expired Feb. 3 without action by Congress. The House Committee on Interstate and Foreign Commerce and the Senate Committee on Armed Forces had debated proposals to delay disposal of the lines but had made no recommendation to Congress.

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Gas Supplies Fail Over Wide Area

Thousands of workers were made idle and heat was severely cut in many homes in the Middle West and East as supplies of natural gas failed to meet industrial and domestic needs during a succession of cold waves in February. More than 200,000 men were laid off in Pittsburgh, Detroit, West Virginia and Ohio when industrial plants closed down to divert natural gas to residential use and home owners were warned that pressure was "dangerously low" in some areas.

Meanwhile, in January and early February, natural-gas interests and the Federal Power Commission acted as follows:

The FPC authorized the Natural Gas Pipe Line Co. of America and the Texoma Natural Gas Co. to increase capacity from 349 to 484 million cubic feet daily in the Chicago area and certain communities in Iowa, Nebraska, Kansas, Indiana and Wisconsin.

The Michigan-Wisconsin Pipeline Co. accepted a certificate from the FPC authorizing a new 1,069-mile line from Texas east at a cost of $53,000,000.

United Fuel Gas Co., Charleston, W. Va., petitioned the FPC for permission to construct and operate 70 miles of 20-in. line at a cost of $2,970,000, increasing capacity by 41,000,000 cu. ft. daily.

The FPC accepted the plan of the Northern Natural Gas Co. for emergency curtailment of firm deliveries to customers in Nebraska, Iowa, Minnesota and South Dakota. According to the FPC, the company's transmission system is capable of delivering only about 90 percent of the estimated firm requirements when very low temperatures prevail over the system area.

Tennessee Natural Gas Lines, Inc., petitioned the FPC for authorization of 181 miles of 16-in. pipeline and 106 miles of 12¾-in. pipeline to carry natural gas to Chattanooga and Knoxville.

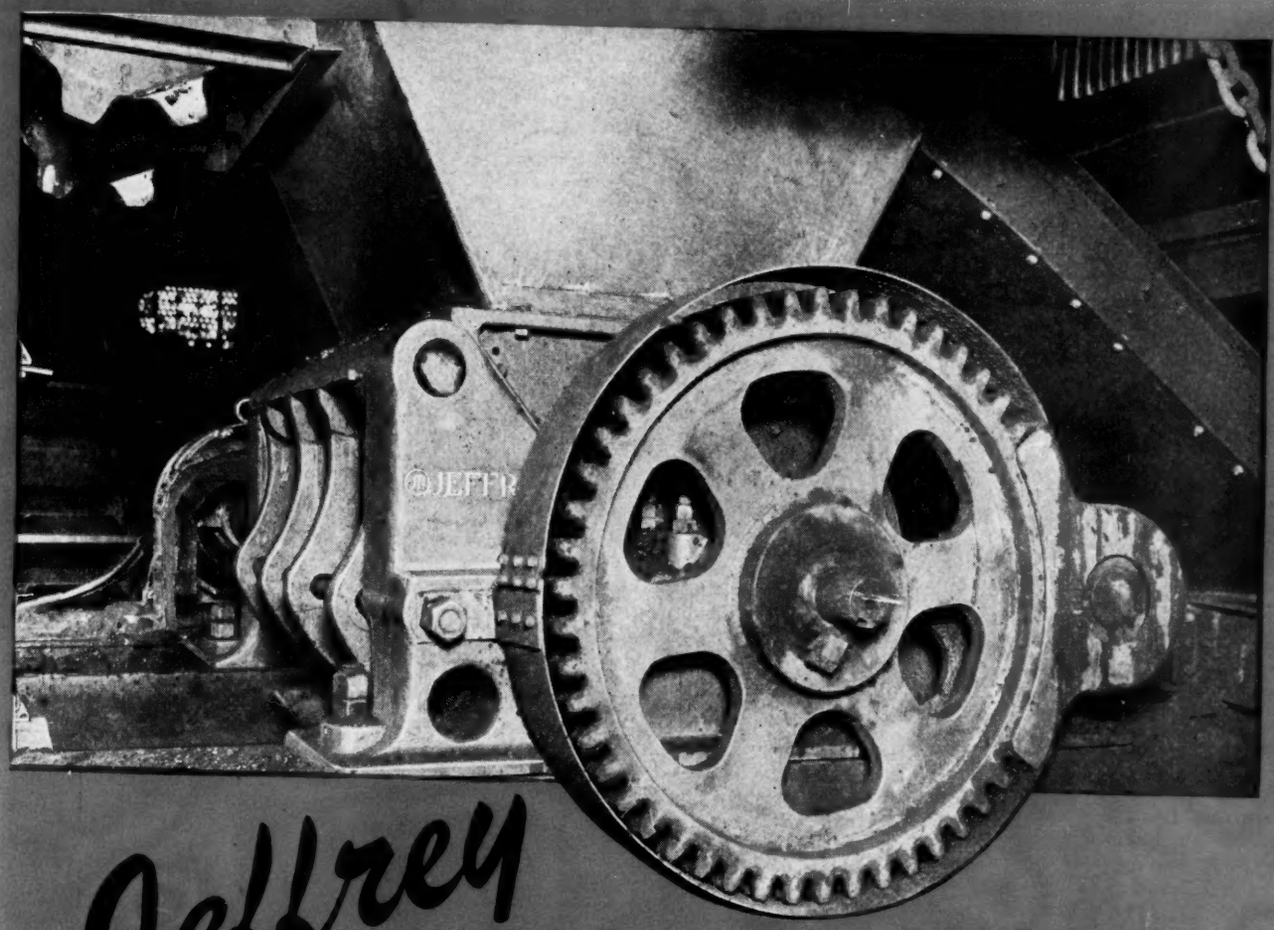
The FPC authorized the Tennessee Gas & Transmission Co. to deliver 1,500,000 cu. ft. daily from its 5,000,000-cu. ft. reserve in the Big Inch line to the Louisville Gas & Electric Co.

The Memphis Natural Gas Co. applied to the FPC for permission to build a 24-in. pipeline from Texas to western Pennsylvania. The line would be laid in three parts, the first to be put in operation by April, 1949, and the ultimate capacity would be 295 million cubic feet daily.

The United Fuel Gas Co. and the Ohio Fuel Gas Co., subsidiaries of the Columbia Gas & Electric Co. applied to the FPC for authority to construct a 100-mile pipeline from Ceredo, W. Va., to Ohio Fuel's Crawford compressor station in Fairfield County, Ohio. The 20-in. line is expected to cost an estimated $4,398,620 and will add 51,000,000 cu.ft. daily to the capacity of the Crawford plant.

The Mississippi River Fuel Corp. asked the FPC for authority to construct a series of loop lines and add compressor stations to increase its daily capacity by 83,000,000 cu.ft. to a total of 266,000,000 cu.ft., for sale to its present customers in the vicinity of Alton and East St. Louis, Ill., and St. Louis, Mo.

Charleston and Pittsburgh groups of the Columbia Gas & Electric Corp. have filed applications with the FPC for authority to construct facilities for servicing increased natural-gas requirements in present markets, at an estimated cost of $25,492,000. Plans include construction by the Atlantic Seaboard Corp. and the Virginia Gas Transmission Corp. of a 286-mile 24-in. pipeline from the United Fuel Gas



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Co.'s Cobb, W. Va., compressor station to connect with companies' system near Rockville, Md., and construction of a 130-mile 14-in. line from a connection with the Manufacturers Light & Heat Co., at Coatsville, Pa., to Port Jervis, N. Y. Construction and enlargement of various compressor facilities are also included in the program.

Construction of Colorado Interstate Gas Co.'s 260-mile 20-in. pipeline was expected to be started in May, pending FPC approval, as the voters of Denver, Colo., granted a 20-year franchise by a vote of nine to one at a special election Feb. 11. The line, which is expected to cost $12,000,000, will expand the natural gas available to Denver from the present 83,000,000 cu. ft. to 215,000,000 cu. ft. daily. According to the Public Service Co. of Colorado, 40,000 homes in the Denver area will install gas-heating equipment when the additional gas becomes available.

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Buckeye Dinner Marks Safety Record

The outstanding safety record of the Buckeye Coal Co., Nemacolin, Pa., was celebrated Jan. 19 at the fourth annual safety banquet held in the Elks Hall, Brownsville, Pa., and attended by 90 company officials, foremen, bosses and guests. The mine has operated 6,562,921 man-hours and mined 5,385,670 tons of coal from July 27, 1944 to Jan. 1, 1947, without a fatality, and the record is still unbroken.

J. L. Mauthe, president of the company, hailed as the "Champion of Champions" Ralph Palcko, senior assistant mine foreman, who has worked 31,000 man-shifts without a disabling accident. Of other outstanding foremen, two have worked 20,000 man-shifts each, six have 15,000 man-shifts, 14 have 10,000 man-shifts and 33 have passed 5,000 man-shifts without a disabling accident.

Other speakers complimenting the men on their unusual accomplishment included John V. McKenna, district State mine inspector, Hon. John I. Hook, president judge of Greene County, Alex Grant, general superintendent of the company, Thomas C. Wilson, safety engineer, and A. W. Hesse, assistant general superintendent and chief engineer. In his talk, Mr. Grant thanked the foremen for their cooperation and praised Mine Foreman Frank P. Waggett for his fine group of safety minded assistants.

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Adding to the Record

Chas L. Bowman, president of the Bowdil Co., Canton, Ohio, calls attention to the fact that the article on mechanical mining at the Norton Coal Co., Nortonville, Ky., entitled "Prefabricated Track Boosts Track-Loader Tonnage at Norco" (December, 1946, *Coal Age*, p. 83) is incomplete in that it failed to mention that cutters are equipped with Bowdil chains, bars and bits. *Coal Age* is glad to take this means of correcting this oversight and completing the record.

Lake Cargo Rates Up

New tariffs applying the recent freight-rate increase to lake cargo coal, effective Feb. 25, will supplement existing tariffs and remove this particular movement of coal from the master Ex-Parte 148-162 tariff. Eastern lines will up rates to Lower Lake ports as follows: bituminous, net ton, 25c., gross, 28c.; anthracite, net ton, 30c., gross, 34c. After Jan. 1, western rates will rise on ex-Lake coal roadhauled from Lakes Superior and Michigan by 15c. per net, 17c. per gross ton. If ex-Lake movement is certified, eastern originating roads will refund per net ton on bituminous, 12½c., on anthracite, 20c.

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New Oil Locomotive Ordered by Santa Fe

A new-type oil-burning gas-turbine locomotive will be built this year for the Santa Fe Ry. by the Baldwin Locomotive Works. Costing $500,000, the new locomotive will be the first attempt to build for railroad use a gas turbine using oil for fuel.

Mine Fatality Rate Rises in December

Accidents at coal mines in the United States caused the deaths of 59 bituminous miners and 12 anthracite miners in December, 1946, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

For the two industries combined, the preliminary December, 1946, fatality rate was 1.49 per million tons, somewhat higher than that of 1.36 for November, 1946, but less than that of 1.68 for December, 1945, later revised to 1.81.

With a production of 42,672,000 net tons, the preliminary December bituminous fatality rate was 1.38 per million tons, compared with 1.25 in November and a revised rate of 1.70 in December, 1945.

The preliminary anthracite rate in December, 1946, in mining 5,080,000 net tons, was 2.36 per million tons, as compared with the November rate of 2.20 and the revised figure of 3.00 for December, 1945.

Fatalities in 1946, by causes and States, and the comparable rates for the twelve months of 1946 and 1945 were as follows:

U. S. COAL-MINE FATALITIES IN 1946, BY CAUSES AND STATES

	Underground													
State	Falls of roof	Falls of face	Haulage	Gas or dust explosions	Explosives	Electricity	Machinery	Mine fires	Other causes	Total underground	Shaft	Open-cut	Surface	Grand total
Alabama	17	..	8	2	2	1	..	..	1	31	..	1	1	33
Alaska	..	..	..	..	..	..	..	..	1	1	..	..	..	1
Arkansas	2	..	..	..	..	..	..	..	2	4	..	..	1	5
Colorado	9	2	5	..	..	1	2	..	..	19	..	..	..	19
Illinois	27	1	17	..	1	1	3	..	3	53	3	..	3	59
Indiana	12	..	1	..	..	3	..	..	2	18	2	..	..	20
Iowa	2	..	2	..	..	..	..	..	..	4	..	..	..	4
Kansas	2	..	..	..	..	..	..	..	..	2	..	..	..	2
Kentucky	69	..	21	..	3	5	4	..	3	105	..	1	5	111
Maryland	3	..	1	..	..	..	..	..	..	4	..	..	..	4
Michigan	1	..	..	..	..	..	..	..	..	1	..	..	..	1
Missouri	2	..	..	..	..	..	..	..	..	2	..	1	..	3
Montana	1	1	2	..	..	..	..	..	..	4	..	..	..	4
New Mexico	1	..	1	..	..	..	1	..	..	3	..	..	..	3
North Dakota	1	..	..	..	..	..	..	..	..	1	1	1	..	3
Ohio	18	..	1	..	1	..	2	..	..	22	..	2	1	25
Oklahoma	3	..	..	..	..	1	..	..	..	4	..	..	1	5
Penna. (bituminous)	76	1	28	..	1	2	6	..	4	118	..	7	11	136
Tennessee	5	1	2	..	..	..	..	..	..	8	..	..	..	8
Utah	9	1	2	..	..	..	..	..	3	15	..	..	..	15
Virginia	24	..	6	13	..	1	1	..	1	46	..	..	2	48
Washington	1	..	2	..	..	..	..	..	..	3	..	..	1	4
West Virginia	124	2	61	15	3	7	7	..	1	220	1	4	12	237
Wyoming	7	..	..	..	..	..	..	..	1	8	..	..	..	8
Total bituminous	416	9	160	30	11	22	26	...	22	696	7	17	38	758
Penna. (anthracite)	93	9	21	2	8	3	1	..	13	150	1	10	9	170
Grand total	509	18	181	32	19	25	27	..	35	846	8	27	47	*928

* Preliminary figures. However, as some injuries during the year may prove fatal later, as has been the case in previous years, it is estimated that final reports from operating companies will show a total of 974 fatalities. Final reports will not be available for some time.

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS[1] JANUARY–DECEMBER 1946 AND 1945

	Bituminous coal				Penna. Anthracite				Total			
	Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons	
Cause	1946	1945	1946	1945	1946	1945	1946	1945	1946	1945	1946	1945
Underground:												
Falls of roof and face	425	462	0.799	0.800	102	73	1.681	1.329	527	535	0.889	0.846
Haulage	160	208	.301	.360	21	23	.346	.419	181	231	.305	.365
Gas or dust explosions:												
Local	3	10	.006	.017	2	5	.033	.091	5	15	.008	.024
Major	27	63	.051	.109	...	...	...	...	27	63	.046	.100
Explosives	11	25	.021	.043	8	9	.132	.164	19	34	.032	.054
Electricity	22	21	.041	.036	3	2	.049	.036	25	23	.042	.036
Machinery	26	38	.049	.066	1	2	.016	.036	27	40	.046	.063
Shaft	7	10	.013	.013	1	3	.016	.055	8	13	.014	.021
Miscellaneous	22	17	.041	.030	13	13	.215	.237	35	30	.059	.047
Total underground	703	854	1.322	1.478	151	130	2.488	2.367	854	984	1.441	1.556
Stripping or open-cut	17	24	.032	.042	10	2	.165	.036	27	26	.046	.041
Surface	38	58	.071	.100	9	11	.148	.200	47	69	.079	.109
Grand total	758	936	1.425	1.620	170	143	2.801	2.603	928	1,079	1.566	1.706

[1] All figures are subject to revision.

MEETINGS

- **Utah Coal Operators Association: annual meeting, April 2, Salt Lake City, Utah.**
- **Virginia Coal Operators Association: annual meeting, April 12, Norton, Va.**
- **Fifth Anthracite Conference, Lehigh University: May 8-9, Bethlehem, Pa.**
- **American Mining Congress: annual convention and exposition May 12-15, Cleveland Auditorium, Cleveland, Ohio.**
- **American Coal Sales Association: annual meeting, May 22-24, Virginia Beach, Va.**
- **Rocky Mountain Coal Mining Institute: spring meeting May 26-28, Utah Hotel, Salt Lake City.**
- **Mine Inspectors Institute of America: annual convention, June 1-4, Denver, Colo.**
- **American Coke and Coal Chemicals Institute: annual meeting, June 9-11, French Lick Springs Hotel, French Lick, Ind.**
- **Smoke Prevention Association: annual meeting, July 7-10, Royal York Hotel, Toronto, Ont. Can.**

Senate Group Urges Oil Development

Oil reserves in the United States are not sufficient to support another major war and a synthetic oil industry should be developed to guard against the loss of foreign oil supplies in any future war, according to the final report of the Senate Special Oil Committee, released Jan. 31. The committee recommended further that legislation be enacted to promote the domestic search for natural petroleum. No danger of a domestic oil shortage in time of peace was seen by the committee's report and it was stressed that source materials for synthetic fuels appear to be sufficient to meet all domestic fuel requirements for many centuries.

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SFAW Order 32 Out; Other Rules Continue

General regulations on the distribution and stockpiling of bituminous coal, rendered unnecessary by recent high levels of production, were revoked Feb. 6 by SFAW Order No. 44, issued by Secretary of the Interior Krug.

The new SFAW order canceled Order No. 32, June 28, 1946, as amended, which provided for equitable distribution of coal mined east of the Mississippi, limited supplies to industrial consumers and gave high preference to retailers who supply homeowners.

In addition to high production, mild weather in December and January lessened

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demand for household heating and enabled industrial consumers to store greater quantities than had been expected.

SFAW regulations remaining in effect are as follows:

Regulation No. 1, as amended, providing for issuance of specific directions in emergency situations.

Regulation No. 14, providing for reconsignment or diversion by SFAW of solid fuels whenever necessary.

Revised Regulation No. 31, providing for approval by SFAW as to availability of solid fuels for export.

Order No. 3, as amended, calling for certain reports by bituminous producers, dock operators and lignite producers and copies of cargo manifests or dumping sheets in certain cases.

Revised Order No. 29, providing for maintenance of records and filing of reports by anthracite producers and wholesalers.

Orders Nos. 2, 6, 11, 15 and 30, covering establishment and operation of advisory boards and committees.

In addition, SFAW will continue to receive on a voluntary basis weekly reports of production and running time of bituminous mines and coal stock reports from retail dealers and manufacturers.

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Governor Duff Names Anthracite Committee

Governor Duff of Pennsylvania Feb. 7 appointed Bruce Payne, president, Payne Coal Co., to succeed Santo Volpe, president, Volpe Coal Co., resigned, as a new member of the Pennsylvania Anthracite Committee. At the same time, the governor reappointed to the committee W. W. Inglis, executive committee chairman, Glen Alden Coal Co., and R. E. Taggart, president, Philadelphia & Reading Coal & Iron Co. Alternates for the committee were named as follows: for Mr. Payne, John C. Haddock, president, Haddock Mining Co.; for Mr. Inglis, Cadwallader Evans Jr., Hudson Coal Co.; for Mr. Taggart, James Prendergast, president, Susquehanna Collieries Co.

The governor's appointments were based on nominations made by the signatories of the Production Control Plan for the Anthracite Industry at a meeting at the Anthracite Institute in Wilkes-Barre, Jan. 29.

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Anthracite Producers' Advisory Board Named

Existing vacancies in the membership of the Anthracite Producers' Advisory Board were filled at a meeting of the signatories of the Production Control Plan for the Anthracite Industry held at the Anthracite Institute, Wilkes-Barre, Jan. 29. Present members of the board are as follows (vacancies filled at the meeting on Jan. 29 are marked with an asterisk):

Regulars: G. B. Fillmore,* Clyde H. Stephens*, R. L. Birtley, W. M. Burrus, L. R. Close, G. C. Cooke, William Gohl, J. C. Haddock, B. H. Hay, James Tedesco,* W. J. Jones, James Prendergast,

T. F. Steele, J. B. Warriner; *alternates*: H. H. Shaver,* O. G. Young,* Harold Smyth,* J. A. Hart,* A. E. Sloat, R. F. Duemler,* H. J. Connolly, G. M. Chisnell, Peter Minichello, Louis Pagnotti,* G. H. Jones, C. W. Stone, J. C. Groome, W. L. Banta.

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Erie R.R. Purchases 34 New Diesels

Orders for nine freight and 25 switching diesel locomotives, costing $7,186,000, for delivery this year, has been announced by the Erie R.R. The new locomotives, to be built by the American Locomotive Co., the electromotive division of the General Motors Corp. and the Baldwin Locomotive Works, will increase the road's diesel equipment to a total of 82.

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Employees Hear Moses At 33rd Annual Meet

"Future plans are big and future opportunity for all men is bigger than ever before," declared Harry M. Moses, president, H. C. Frick Coke Co., speaking at the 33rd annual dinner of the Association of Employees of the United States Coal & Coke Co. in Bluefield, W. Va., Feb. 1. Mr. Moses stressed his own pride in the company and the company's pride in itself and declared that every employee has the right to share in that pride. Reviewing the history of the company for 35 years, the speaker emphasized its contribution to the war effort, its survival under political and economic stresses and its maintenance of high standards of quality. The record, he pointed out, deserves the loyalty its employees have so willingly given it.

T. J. McParland, general superintendent, U. S. Coal & Coke Co., was toastmaster at the dinner meeting. Other speakers included George W. Sweeney, vice president and comptroller; G. M. Thursby, director of industrial relations; G. H. Sambrook, safety director, and K. L. Konnerth, assistant to the president in charge of engineering. About 400 employees and guests attended.

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Consolidated Edison to Up Manufactured Gas

Based on increasing gas demand during the past three years and expected new construction and conversions, its gas load in the New York area for the winter of 1947-48 will be 18 percent over that of the 1945-46 winter, for a total of 300 million cubic feet daily, the Consolidated Edison Co. of New York, Inc., recently announced in outlining plans for expansion of its capacity.

One step in its program is the enlargement of its manufacturing plant at Hunts Point at a cost of $6,750,000, to provide an additional 32 million cubic feet daily. A liquefied petroleum gas plant also has been installed at the Hunts Point plant and

TAX REVISION...

Can Make or Break American Business

IS THE American way of life—progress by private initiative—going to get a fair chance to demonstrate its superiority over all the challenging varieties of collectivism?

That's the real question before Congress as it confronts the long labor of remodeling the federal tax structure. What Congress does about taxes will come pretty close to making or breaking the U. S. A.

Today the tax colossus that sprawls across the national economy is unguided by any central nervous system. Its crushing weight comes down first here, then there, as the giant wobbles around, unguided by any central purpose except to grab as much as it can.

The central purpose of a tax system is simple. It should raise the necessary revenue without placing unnecessary fetters on enterprise.

As recently as 1929 federal taxes took only one dollar out of every twenty of national income. A loose-jointed and inconsistent tax structure was a nuisance then. But it wasn't serious.

Today the federal tax burden is the dominant element in the nation's economy.

Even if Congress succeeds in cutting $6 billions out of President Truman's $37.5 billion budget, federal taxes still will take about one dollar out of every five of the national income. And few Congressmen are hopeful enough to think that they can get the tax load below $25 billion for any year that is in sight.

Drastic Budget Cuts Required

Indeed, to get the tax load down to $25 billion, Congress will have to stop treating expenditures, like those for military purposes and veterans, as politically sacrosanct. Congress must scrutinize *every* item in the budget. Economy must go along with tax cutting or we shall end in bankruptcy.

Suppose that expenditures are slashed to the bone. Our taxes *still* will be so heavy that the *way* they are loaded on the nation's back will make a big difference in how well the nation gets along. That's something which the postwar boom has tended to obscure. It will become much clearer as this boom wears off. Then a remodeling of the federal tax system to remove its manifold obstructions to private enterprise will be of transcendent and obvious importance to everybody.

Tax Experts Agree

The remodeling will require political courage plus tax wisdom. Congress must supply its own political courage. But it can lean on tax experts for tax wisdom. Fortunately, tax experts now agree on the necessary reforms—especially on those that will remove obstructions to business. How well the tax experts agree is shown in the charts on the next page, summarizing answers to a questionnaire on possible federal tax reforms. The questions were asked by the Department of Economics of the McGraw-Hill Publishing Company. The answers came from a broad cross-section of tax experts, including the authors of a considerable crop of books on postwar federal taxes and what to do about them.

The experts agree (see the charts) that double taxation of corporate dividends should stop.

They agree that the tax rate on corporate income (now 38 percent) should be reduced as rapidly as possible to the initial rate on individual income (now 20 percent).

And they agree overwhelmingly that it is desirable to let net losses be subtracted from net profits over a 5-to-6-year period in computing business income for tax purposes.

All three changes would stimulate corporate initiative and hence make jobs. Averaging business incomes would make new ventures attractive even though these ventures *might* result in early losses. Reduction of the corporate income tax would have the same effect. So, too, would the elimination of that highly discriminatory provision whereby corporate dividends are taxed first as corporate profits, and again when received as income by individuals.

Penalties on Incentives

Beyond these changes, there must be an end to tax penalties on *individual* initiative. Consider the enterprising business man whose income fluctuates markedly from year to year. Because of his enterprise he may pay, on the same income, twice as much federal income tax as the man who plays it safe for a steady income. That's because he can't average his personal income over several years for tax purposes. He can count on heavy taxation of his good-year profits with no chance for offsetting against them his bad-year losses. It is a case of heads you lose, tails the tax collector wins. Eighty-six percent of the experts agree that an income-averaging allowance for individuals is desirable.

Three-quarters of them also agree that tax rates at the top end of the individual income scale (now running up almost to 90 percent) should come down. In my judgment, the total tax should not amount to more than 50 percent to encourage business men to venture for high stakes.

Advocating tax relief for men in the higher income brackets—and particularly for management men—has been considered political suicide for more than a decade. Some members of Congress still hold that view. A Democratic Congressman from Michigan told an Illinois colleague who advocated cutting upper bracket taxes, "If you put that idea forward at home, you won't come back."

The Congressman has an even better chance of not going back if our economy bogs down. One of the best ways to bog it down is to keep the taxes that destroy business incentives and block enterprise—for example, the confiscatory rates which drive the people in the high brackets away from risk-taking.

To give the American system of individual enterprise a fair chance was clearly the mandate of November's election. To give it that chance, enterprising business men must have a chance to make large rewards—as well as the always-present chance to lose their shirts. Under present tax rates, they don't get a break.

Prevailing federal taxation throttles bold business enterprise in other ways. It fails, for example, to encourage research and rapid industrial modernization. It tends to siphon investment away from private enterprise, driving it into tax exempt state and local securities. (The experts agree almost to a man that such tax exemption must be eliminated.) The list of obstacles could be amplified.

Hit-and-Run Revision Disastrous

Most of the reforms needed to prevent the federal tax system from smothering enterprise would lower federal revenues, at least temporarily. Elimination of the double taxation of corporate dividends might lop off $800 million. Dropping the corporate income tax from 38 percent to 20 percent might cut away as much as $4 billion.

Because we can not avoid enormous federal expenses in the years immediately ahead, all badly needed reforms of the type to which this article is confined obviously can't be made at once. Also there are other tax reforms bearing on consumption which obviously should be weighted in an over-all program of tax revision.

But this is equally obvious: We should have a general design for tax revision which would line up all the necessary steps. Then we could get ahead with tax reductions as rapidly—and as sensibly—as revenue requirements and political courage would permit. Tax cutting may come piece-meal, but tax planning must not.

Through such a design we might discover that some decidedly beneficial improvements in the federal tax structure can be made at relatively slight cost. But today there's no way to be sure. No one in Washington with access to the information has even undertaken to make the necessary estimate.

Instead, federal tax revision continues to be a hit-and-run business—and a short-run political business. Take, for example, the proposal of a 20 percent tax reduction across the boards. There are virtues in such a proposal. But how they stack up beside many other extremely urgent needs for tax reform remains a mystery.

Congress must dispel such mysteries. Only in that way will it do the job of converting our present jerry-built tax structure into a moderately safe abode for the American system of private initiative, sparked by adequate incentives.

EXPERT OPINION ABOUT TAX REVISION

TAX EXPERTS THINK WE SHOULD:	% Of Tax Experts Favoring the Proposed Changes
1 ***Eliminate double taxation of corporation dividends*** which are now taxed as corporate profit and then again as individual income.	92%
2 ***Reduce corporation income tax rate (now 38%)*** as rapidly as budget needs permit until it equals the initial rate for individual incomes (now 20%).	73%
3 ***Provide for averaging business' taxable incomes*** over a period of about 6 years to allow for losses in bad years.	97%
4 ***Provide for averaging individuals' taxable incomes*** over a period of a few years so as to treat fairly those whose incomes fluctuate.	86%
5 ***Reduce upper bracket individual income tax rates*** to a maximum of 50% in the $100,000 bracket and 75% in the million and over bracket.	76%
6 ***Treat capital gains, now taxed at a lower rate,*** like other income but provide full allowances for losses.	64%
7 ***Remove the privilege of tax exemption*** from all future issues of state and local government bonds.	92%

James H. McGraw, Jr.

President McGraw-Hill Publishing Company, Inc.

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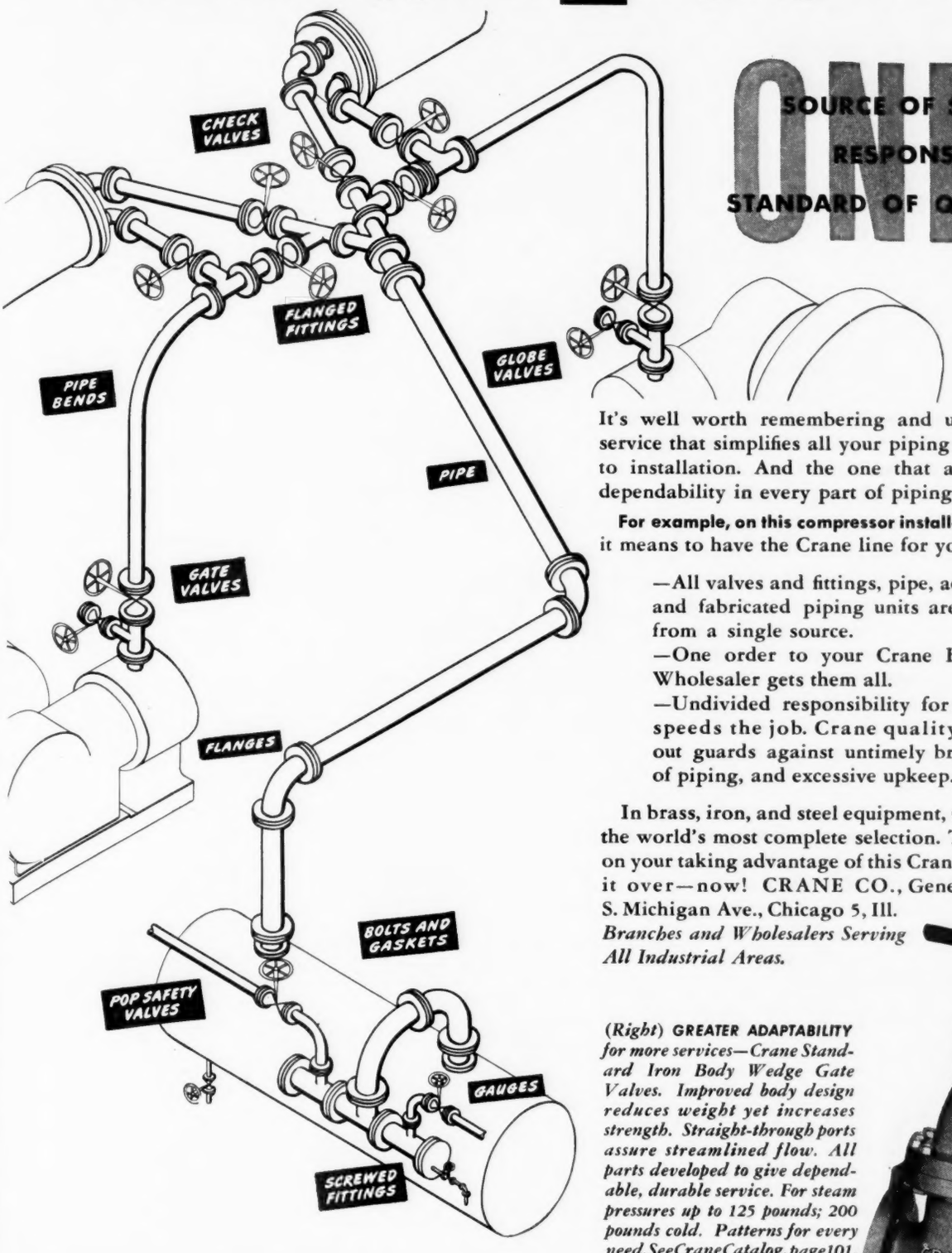

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Independent Mines Cut Anthracite 50c.

Competition due to warm weather and adequate supplies forced some independent anthracite producers to lop 50c. off their price on Feb. 4. All other independents were expected to follow suit almost immediately.

The reduction made anthracite prices uniform throughout the producing area. The 50c. reduction made by the independents was the extra charge they were permitted to make during the war and after under OPA regulations. Last month was reported to be the warmest January in the past 50 years throughout the greater part of the anthracite-consuming territory.

•

To Build Chassis For Turbine Locomotive

Two locomotive chassis of independent designs for the first two experimental gas-turbine locomotives burning powdered coal will be built by the American Locomotive Co. and the Baldwin Locomotive Works, according to an announcement on Feb. 7 by John I. Yellott, research director, Locomotive Development Committee.

Alco will build a two-cab chassis for the gas-turbine power unit now under construction by Allis-Chalmers and Baldwin will build the chassis for the Elliott Co.'s turbo unit.

At the same time, Mr. Yellott announced new financial support for the locomotive program from the Illinois Central R.R., the Virginian Ry. and the Pocahontas Fuel Co. The entire research and development program, Mr. Yellott said, now approximates $3,000,000. The pilot plant is now in operation at Dunkirk, N. Y.

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Wildcat Sitdowners Win Pay Return

An unauthorized sitdown strike of 13 miners at the Lansford colliery of the Lehigh Navigation Coal Co., Inc., ended Feb. 15 after 60 hours when the company agreed, pending settlement of the dispute, to restore the amounts docked from all consideration pay for failure to work a full 7-hour shift. Evan Evans, vice president, declared that the company was "placing the health of the sitdowners above all else" in deviating from its policy of refusing to deal with employees while unauthorized strikes were in process. The men had rejected all appeals by company

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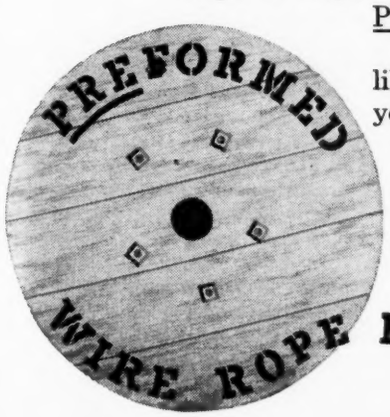

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and U.M.W. officials to end the sitdown and submit the question through the usual grievance channels.

The dispute started when the company ruled that in order to collect consideration pay the miners must stay on the job the full seven hours unless released by their foreman. The men maintained that as contract miners they could determine their own working hours and were not violating their contract.

A strike by 6,000 miners in the Panther Valley area begun in sympathy with the sitdowners continued after their return to the surface and apparently would require full settlement of the issue. Work was resumed Feb. 24, but 24 hours later 5,000 of the 6,000 strikers walked out again after the 1,000 miners at the Lansford colliery had refused to return to work and called on other miners to stay out. The only colliery reported operating was the Tamaqua colliery of the Lehigh Navigation Coal Co., employing about 1,000 men.

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Fire Destroys Two Tipples

The tipple and an adjoining building of the Puritan Coal Corp., near Delbarton, W. Va., were destroyed by a fire of undetermined origin Feb. 20, with a loss estimated to be more than $100,000. While the 200 employees left the mine without difficulty, its operation will be suspended for several months, according to Frank Smith, president of the firm, because of lack of materials to begin reconstruction of the structure. The mine produces about 1,000 tons daily.

A fire that raged during a snow storm Feb. 20 destroyed the breaker of the Tunnel Ridge Coal Co., near McAdoo, Pa., with an estimated damage of $100,000. The breaker had been idle since last Sept. 26 and was being dismantled.

•

Lehigh Conference Appointments Made

Plans for the fifth anthracite conference of Lehigh University, May 8-9, were progressing last month with the announcement of committees by A. Copeland Callen, head of the department of mining engineering at Lehigh and general chairman of the conference. Because of the war, the conference has not been held since 1941.

Raymond C. Johnson, vice president in charge of research, Anthracite Institute, will serve as vice chairman, and honorary chairmen will include Dr. Martin D. Whitaker, president, Lehigh University; F. W. Earnest Jr., president, Anthracite Institute; Millard Dodson, president, Weston Dodson & Co., Inc.; and J. B. Warriner, president, Lehigh Navigation Coal Co.

A preliminary list of papers to be presented at the conference has been announced as follows: Control of Clinkers in Fuel Beds, by Charles Schantz, Weston Dodson & Co.; The Status of Radiant Heating, by Harry K. King, A. M. Byers Co.;

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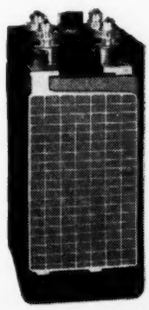

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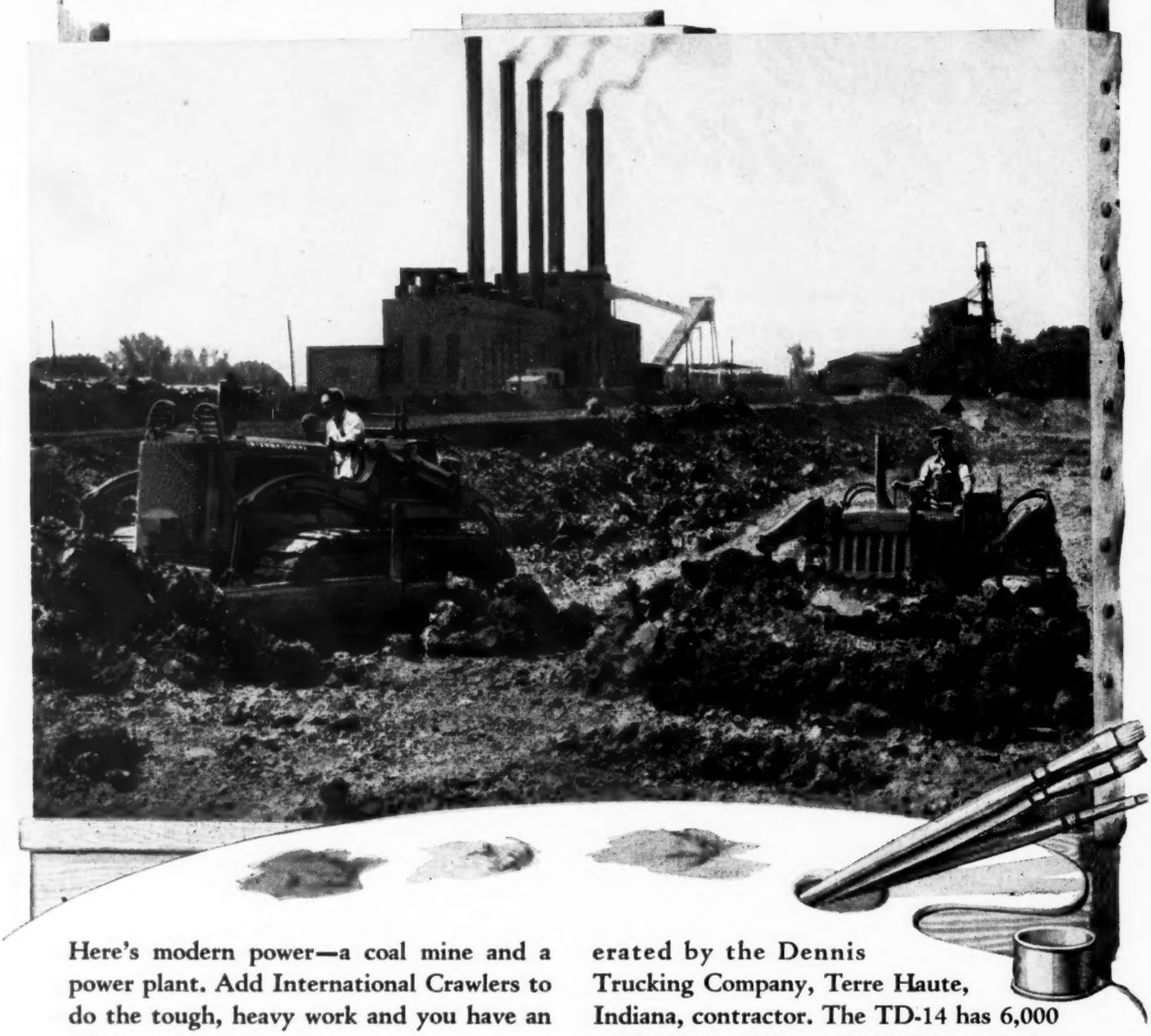

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Cupola Operation With Anthracite, by Dr. C. C. Wright, Pennsylvania State College; A Review of Possible New Uses for Anthracite, by A. J. Johnson, consulting engineer; History of Labor Relations in the Anthracite Regions, by Dr. Thomas E. Larkin, umpire, Anthracite Board of Conciliation; Safety Organization and Methods in the Production of Anthracite, by Clyde Brehm, Susquehanna Collieries Co.; Physical Equipment in Retail Yards, by George H. Israel, Lehigh Navigation Coal Co.; the New Anthratube Principle of Combustion, by Dr. Raymond C. Johnson, Authracite Institute; The Carbon-Dioxide Lock and Its Remedies, by C. F. Golding, Anthracite Institute; and Pelletizing Anthracite, by Paul A. Mulcey, Anthracite Institute.

Stripping Laws Asked In Ohio and Maryland

Legislators in Ohio and Maryland have moved to restrict stripping activities with the introduction of new bills that would require reforestation, bonding of operators and restoration of mined-over lands to their original contours.

In Ohio, one stripping bill, introduced Jan. 15, would require a bond of $300 per acre to guarantee replacement of soil moved by stripping within a reasonable time. Strippers would be licensed by the Division of Mines of the Department of Industrial Relations and a fine of $50 to $1,000 would be levied for non-compliance, with each day's unlicensed operation considered a separate offense.

A second bill, based on a 14-months' investigation by the Ohio Strip-Mine Study Commission, was introduced Jan. 21, though the nine-man commission had not yet voted its approval of the bill. This bill calls for a $50 annual license fee for operations producing more than 250 tons of any mineral, a bond of $100 per acre and not less than $1,000 to guarantee compliance with the law. The bill further would empower the State to require the operator to spend as much as $50 per acre to put a cover crop on the stripped land and to demand leveling of spoil-bank peaks to a width of 15 ft.

In the Maryland legislature, a bill was introduced to require strip operators to plant denuded hills with trees, shrubs and grasses, posting a bond of $300 per acre to guarantee performance within a year after the halting of operations.

Meanwhile, foresters and strip-mine operators voiced a need for more forests at a meeting of the Ohio Reclamation Association in Columbus, Ohio, Jan. 22. R. A. Paton, associate State forester, urged planting of a 6- to 8-million tree nursery in northern Ohio and G. A. Chapman, chief, division of forest management, stressed the growth of black locust on spoil banks in Perry County. J. F. Tillinghast, consulting forester, Mt. Hope, W. Va., asserted that the timber needs of the Belmont, Jefferson and Harrison County coal fields in Ohio amount to 350,000 acres of forests.

The Ohio Reclamation Association was formed by strip-mine operators to study the treatment of spoil banks.

High Cost Closes Anthracite Colliery

Operation of the Bell Colliery, Tuscarora, Pa., one of the oldest mines in the lower anthracite region, has been discontinued by the Tuscarora Stripping & Mining Co. because of the high cost of operation, according to company officials. The mine had been operating on a reduced scale recently and the 80 men employed there are expected to be transferred to a new slope being developed near Brockton. The breaker had been closed six months ago.

•

Big Sandy Institute Makes Safety Awards

Consolidation Coal Co. (Ky.) Mine No. 115, Van Lear, Ky., won the Class A award and the Caudill-Ward Coal Co., Hellier, Ky., won the Class B award for safety in the Big Sandy-Elkhorn field in 1946, it was announced at a meeting of the Big Sandy-Elkhorn Coal Mining Institute, Pikeville, Ky., Jan. 27.

In addition, a special award went to the Princess-Elkhorn Coal Co., Middle Creek, Ky., for a no-fatal-accident record in the production of 1,888,874 tons of bituminous coal between September, 1942, and December, 1946.

In earning the awards, Consolidation's Mine No. 115 produced 255,568 tons with only 13 lost-time accidents and Caudill-Ward produced 104,917 tons with no lost-time accidents.

The plaques signifying the awards were to be presented at a meeting of the institute at the Pike Country Club near Pikeville, Ky., Feb. 21.

•

Strip Control Fought in Indiana

Daviess County, Indiana, continues to highlight coal mining interest in the State Legislature, where the recent controversy over use of property by coal mining interests in that county is the subject of an amendment to Senate Bill No. 17, which passed the Senate by a vote of 34 to 2 and is now under study by the House. The amendment would prohibit any ordinance which would prevent, outside of urban areas, the complete use or alienation of any mineral resources or forests by the owner.

Several Daviess County property owners scored the amendment as an anti-soil conservation rider. Approval of the bill itself, which recodifies city and county plan commission laws, was expressed by a spokesman for the landowners, but the amendment was declared to be "a vicious clause designed to destroy rich soil."

According to the Indiana Coal Producers Association, the mining interests are interested only in mining two sections of Daviess County. Farmers living on the land in question have been greatly misinformed, it was said, and mining would extract from the land coal whose value would far

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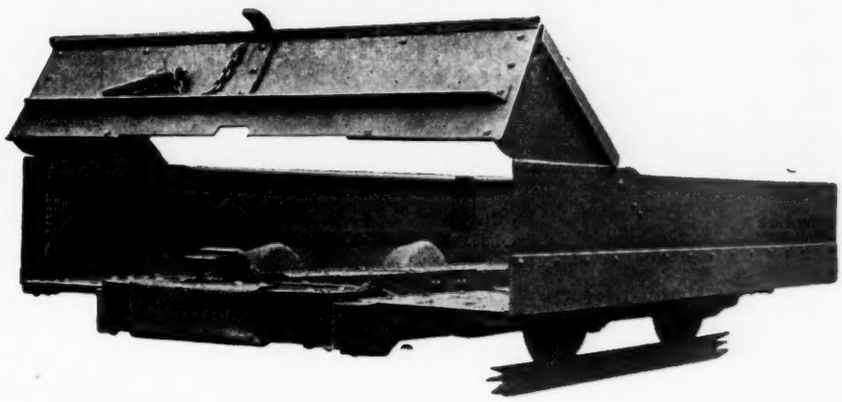
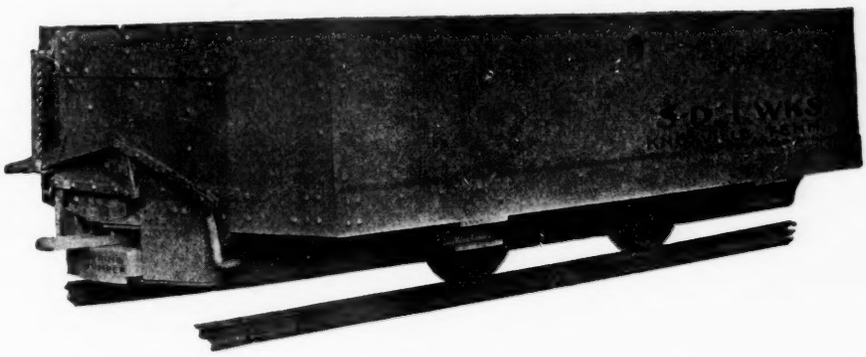
Throughout the coal mining industry, for almost 43 years, Sanford-Day has been recognized for their ability to build End-Dump and Rotary-Dump cars that stand up through the years to meet the hard service demanded of these cars. We developed the "low-floor" type of large capacity cars and our "Whopper" End-Dump and Rotary-Dump Cars will give you maximum capacity for any given overall dimensions.

S-D "WHOPPER" END-DUMP CAR

With our cantilever construction, heavy structural steel side truss members easily support the heaviest load without sagging. They are attached to the rugged cross cantilever members at the body corners and run from one end of the body to the other. This car has Drop Axles and Armor plate bumpers. No other design of End-Dump car approaches its simplicity, strength, ruggedness and long life. No binders on side to strip off.





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exceed any crop that might be produced on the land over a period of 300 years.

Other objectors, including Judge Curtis Shake of Vincennes, spokesman for the landowners of Daviess County, said passage of the amendment would injure the land and tie the hands of the people of the county. The landowners themselves declare that relatively rich deposits of coal are located on their farms in specified areas of the county and that approximately 1,500 acres have been purchased for strip mining. This, they claim, will leave the land worthless and unproductive, charging that final adoption of the amendment would create destruction of more than 2,500 acres of productive farm land through strip-mining operations.

•

P. & R. Tell Miners Of Accident Costs

Employees of The Philadelphia & Reading Coal & Iron Co. involved in lost-time accidents during 1946 lost an average of $234.30 in earnings as a result of these accidents, the company said last month in another of its series of monthly pamphlet messages to its employees.

Admitting that cost was of secondary importance when compared with the human aspect of accidents, the pamphlet, devoted wholly to mine safety, asserted that "in 1946, 1,233 man-accidents—large and small, but not including fatal accidents—occurred at our operations, involving a total of 30,637 man-days lost from work. The men involved in these accidents lost, on the average, $234.30 in earnings because of time lost."

Pointing out that "minutes of caution may save years of regret," the company listed ten basic rules of safety for its employees, adding "Make them your Ten Commandments. Observe them religiously."

•

Three Cities Extend Smoke Control Study

Concern with smoke control continued in January and early February in such widely scattered cities as New York, Minneapolis, St. Paul and Cincinnati.

In Cincinnati, Mayor James Stewart pledged that the council law committee would examine 500 pages of testimony given at council hearings in an effort to have an ordinance ready early in February. The mayor intimated that the proposed ordinance would include some aspects of the St. Louis plan and some elements advocated by the Cincinnati coal interests. Coal men are guarding against an ordinance that will seriously damage the coal industry, but they share with other interests the desire for a cleaner city.

In New York City, Health Commissioner Weinstein, with the support of Mayor O'Dwyer, announced a campaign for better enforcement of the city's anti-smoke laws and asked for $100,000 for preliminary plans and additional personnel to begin the program.

Minneapolis and St. Paul got under way

with a one-year survey of atmospheric conditions in the Twin Cities with the arrival from Cincinnati of H. B. Lammers, chief engineer, Coal Producers' Committee for Smoke Abatement, who will supervise the Twin Cities survey. Lammers was accompanied by a crew of 15 trained workers.

•

Coal Heating Service Formed in Des Moines

Coal Heating Service of Des Moines, Inc., has entered into an agreement with the Coal Heating Service Division, National Coal Association, thus becoming the first Coal Heating Service unit to get into operation west of the Mississippi and the fourth in the nation. Members of the new unit sell approximately 450,000 tons of bituminous and coke at retail annually. Added to service units formed elsewhere, this brings the total of bituminous tonnage handled through Coal Heating Service groups to slightly less than 4,000,000 tons.

Officers of Coal Heating Service of Des Moines, Inc., are as follows: J. J. Van Dreser, president; K. G. Carney, secretary; Verne P. Smith, treasurer; and M. G. Youngquist, managing director.

•

Mines Bureau Lists Respiratory Devices

The following respiratory protective devices have been approved by the United States Department of the Interior, Bureau of Mines, since the second supplement to I.C. No. 7237 was issued September, 1945, according to the third supplement to I.C. 7237, dated December, 1946.

Self-Contained Breathing Apparatus

Chemox oxygen breathing apparatus (½-hour self-contained oxygen-generating breathing apparatus). Approval BM-1307, Mine Safety Appliances Co., Oct. 3, 1946.

Scott Air-Pak self-contained breathing apparatus (½-hour self-contained compressed air breathing apparatus). Approval BM-1308, Scott Aviation Corp., Oct. 3, 1946.

M.S.A. demand-type oxygen apparatus (½-hour self-contained compressed-oxygen breathing apparatus). Approval BM-1309, Mine Safety Appliances Co., Oct. 3, 1946.

M.S.A. demand-type air apparatus (½-hour self-contained compressed-air breathing apparatus). Approval BM-1310, Mine Safety Appliances Co., Nov. 26, 1946.

Gas Masks

Type B: Organic vapor masks—M.S.A. organic vapor mask with supersize G.M.A. canister. Approval BM-1441, Mine Safety Appliances Co., Aug. 2, 1946.

Type C: Ammonia gas masks—M.S.A. ammonia gas mask with supersize G.M.D. canister. Approval BM-1442, Mine Safety Appliances Co., Aug. 29, 1946.

Type N: Universal gas masks—with filters that afford respiratory protection against toxic dusts, fumes, mists, fogs, and smokes: LaFrance Protexall gas mask. Ex-

tension of approval BM-1434, American-LaFrance and Foamite Industries, Inc., March 2, 1943. (Inadvertently omitted from previously published supplements).

Supplied-Air Respirators

Type CE: Abrasive blasting helmets, hoods, or masks—M.S.A. Blastfoe abrasive helmet. Approval BM-1919, Mine Safety Appliances Co., Oct. 1, 1946.

McDonald Blastfoe abrasive helmet. Extension of approval BM-1919, B. F. McDonald Co., Oct. 3, 1946.

Dispersoid (Dust, Fume, and Mist) Respirators

Pneumoconiosis-producing, nuisance, and toxic dust respirators (for all dusts)—Willson respirator No. 750D.* Approval BM-2151, Willson Products, Inc., Oct. 5, 1944.

Willson respirators Nos. 5D* and 45D*. Approval BM-2152, Willson Products, Inc., Oct. 19, 1944.

A.O. R-2000 respirator. Approval BM-2154, American Optical Co., Jan. 2, 1947.

Non-Emergency Gas Respirators (Chemical-Cartridge Respirators)

Type B: Organic vapor respirators—Willson No. 731 Chemical Cartridge respirator. Approval BM-2303, Willson Products, Inc., July 30, 1946.

* Extension of approval has been granted on this respirator to cover protection against pneumoconiosis-producing mist and chromic acid mist.

•

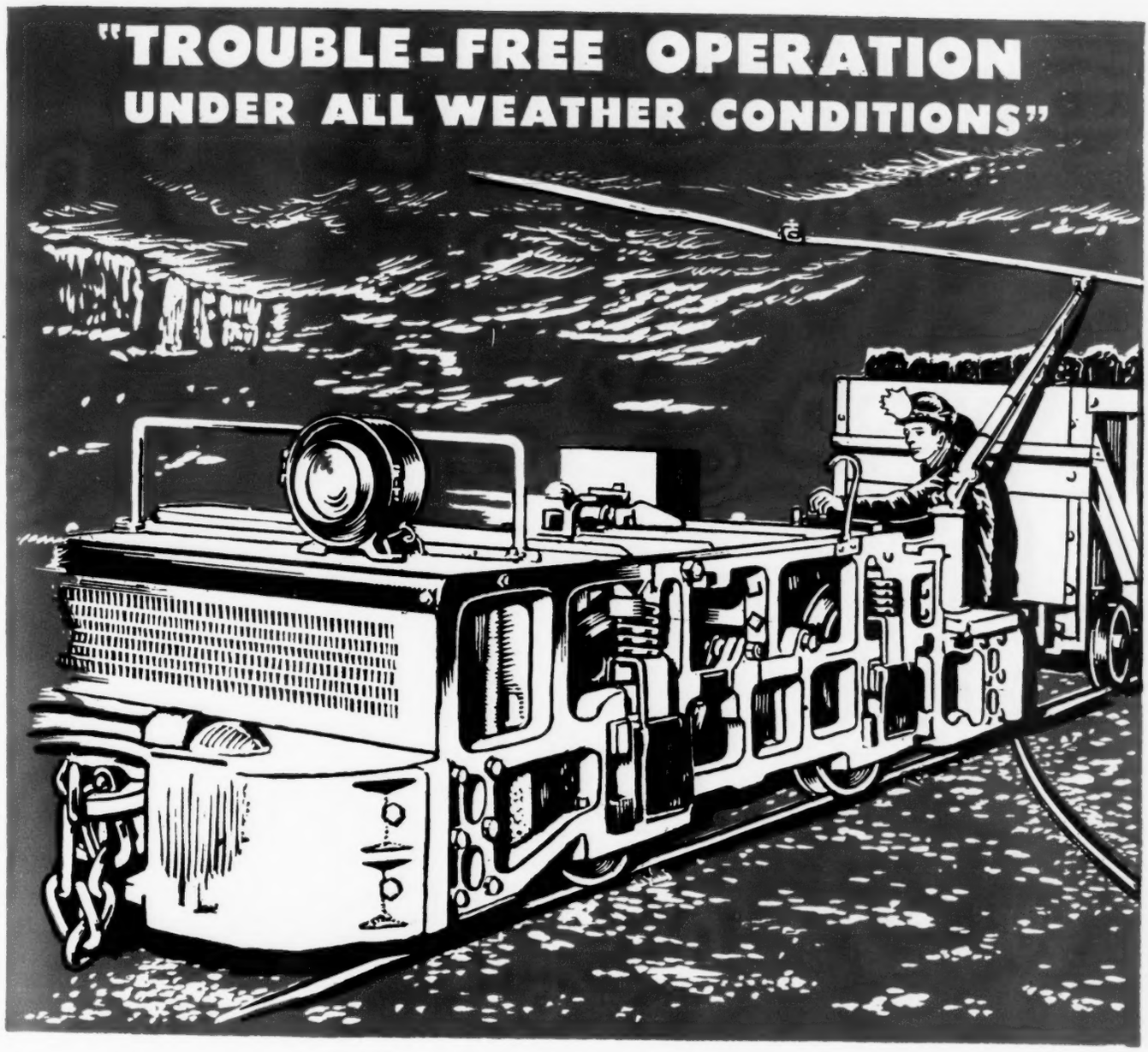
Canadian Coal Study Favors U. S. Imports

Following a two-year study of Canada's coal resources, the three-man Royal Commission on Coal recommended early in February that even though Canada has 2,700 years of coal reserves, it should continue to import five-eighths of its consumption from the United States.

In hearings prior to the commission's report, the Anthracite Institute had filed briefs and offered testimony to point out the anthracite industry's contribution to the solution of Canadian fuel problems and its ability to keep the Canadian market supplied with anthracite in the future. Certain Canadian interests had proposed a subsidy to bring larger quantities of Alberta coal to the central and eastern Canadian markets.

The Royal Commission's report pointed out that Canadian coal cannot compete with anthracite because of the geological formations of Canadian deposits and their distance from consumers. In considering British anthracite, which would continue entering Canada duty-free, the commission reported that "it is not clear from the present condition of the industry in the United Kingdom that Canada can rely on a continuous supply of anthracite at pre-war prices."

The commission recommended that Canada assist her own coal industry by continuing government subventions of about $2,400,000 a year now being paid



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on freight rates and that existing duties on American coal be continued over the objection of American bituminous and anthracite industries.

Other highlights of the report:

1. A coal board should be established to "keep Canada's energy requirements under continuous review and to advise upon and administer transportation subventions."

2. "Overdue" mechanization of Nova Scotia mines should be effected by the operators without capital expenditure assistance from government funds.

3. Production subsidies should be withdrawn completely on the abandonment of price control.

4. Nationalization would not necessarily improve the position of the mines or prevent ultimate collapse of the industry. Rather, the conditions of the depressed sections of the industry present a challenge to private enterprise to use its initiative to get mining back on its feet, with the cooperation of the working personnel.

•

Acetylene May Add New Anthracite Use

Capitalizing on German methods of preventing explosions of acetylene, the American chemical industry sees the possibility of using anthracite coal to produce calcium carbide, the principal source of acetylene. Heretofore, various synthetics for plastics, rubber and other compounds have been made in the United States from petroleum rather than coal because of the danger of exploding acetylene. It is expected that the new-found German processes will be used in this country in the near future.

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Personal Notes

Dennis L. McElroy, chief engineer of the Consolidation Coal Co. of W. Va., had been elected vice president in charge of engineering of the Pittsburgh Consolidation Coal Co., the parent organization, and will direct a concentrated program of

Dennis L. McElroy

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Here's an interesting picture story of Republic's THREE *different* High Strength Steels—ALDECOR, COR-TEN and DOUBLE STRENGTH.

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modernization at the company's 40 mines. Mr. McElroy was formerly director of the School of Mines of West Virginia University, and from 1941 to 1943, when he resigned to join Consolidation, was chief of the Coal Section of the War Production Board.

Joseph Pursglove Jr. has been elected vice president of the Pittsburgh Consolidation Coal Co. in charge of a newly established division of research and development, which is to concentrate on the extraction of gasoline, fuel oils and gas of high-heat content from coal. Mr. Pursglove has been president of the Pursglove Coal Mining Co. and other Pittsburgh Consolidation subsidiaries.

Joseph Pursglove Jr.

Arnold Schell, formerly mine foreman, Blaine mine, has been appointed superintendent, Blaine and Stanley mines, Lorain Coal & Dock Co., Blaine, Ohio. **Eli Veydt,** assistant general mine foreman, succeeds him as mine foreman at the Blaine mine.

William D. Irwin, Hazard, Ky., and **Rex Brown,** Salyersville, Ky., have been appointed Kentucky State district mine inspectors.

Frederick Benington, chemist, has been appointed to the fuels technology research staff of Battelle Memorial Institute, Columbus, Ohio.

Samuel P. Carter, formerly power engineer, has been promoted to maintenance supervisor, Nellis mine, mining division, American Rolling Mill Co., Nellis, W. Va. **Paul Doss** has been promoted from section foreman to general night foreman at the company's Montcoal Nos. 1, 5 and 6 mines, Montcoal, W. V.

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Obituary

Thomas S. Ray, 50, general superintendent, Jeanne-Francis Coal Co., Letcher, Ky., died Jan. 26 at his home after a brief illness. Mr. Ray was a native of Charleston, W. Va., and had been connected with several coal companies in that region previ-

Stop Oil Contamination Before It Starts!

As THIS overhead cutter bites into the coal, it works continuously in an atmosphere of gritty coal-dust and sometimes spraying water. Contamination of the oil is a constant danger.

Contamination becomes worse when bearings and seals wear, admitting dust and water into the gear housings. The right way to reduce contamination is to reduce wear—and that's a job for the right oils!

For the cutter gears of machines like this, you need Gargoyle Vactra Oils. They form exceptionally strong, persistent films that cling tightly to metal surfaces, resisting rupture under continuous shock loads, and reducing wear to a minimum. For the roll-over gears, you'll get maximum protection with Gargoyle Viscolite Oils. Their tacky, adhesive character makes them particularly effective in maintaining strong lubricating films in spite of the wiping action of the worm gear.

Consult your Socony-Vacuum Representative on all coal mine lubrication problems!

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FOR EVERY MACHINE . . . EVERY OPERATING CONDITION

ous to joining Jeanne-Francis recently.

Richard Samuel Jr., 62, mine foreman, Eberts Coal Co., Wellston, Ohio, died Jan. 28 at the Holzer hospital, Gallipolis, Ohio, following injuries received in a slate fall.

William G. Polk, president, Block Coal & Coke Corp., Knoxville, Tenn., died Feb. 14 at his home in Knoxville.

Joe Campbell, 73, timbering foreman for the West Kentucky Coal Co. for many years, died Feb. 11 at his home in Earlington, Ky.

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Association Activities

Operators' Association of Williamson Field at its annual meeting Feb. 7 elected as president, C. A. Hamill, president, Sycamore Coal Co. W. W. Walker, president, Majestic Collieries Co., was named vice president; J. D. McLaughlin, president, Earlston Coal Co., was elected treasurer; and Joseph J. Ardigo was reelected secretary. Elected directors were: J. E. Biggs Jr., president, H. E. Harmon Coal Corp.; O. W. Evans, general superintendent, fuel department, Norfolk & Western Ry.; J. W. Strickler, president, Buchanan County Coal Corp.; W. S. Leckie, president, Leckie Collieries Co.; Laurence E. Tierney Jr., president, Eastern Coal Corp.; F. L. Long, general superintendent, Emperor Coal Co.; J. M. Tulley, president, Crystal Block Coal & Coke Co.; Frank P. Smith, president, Puritan Coal Corp.; Paul D. Ritter, president, Red Jacket Coal Corp.; and P. P. Kerr, general manager, Kentland-Elkhorn Coal Corp.

Upper Buchanan Smokeless Coal Operators' Association has elected the following officers: C. A. Hamill, president; J. W. Strickler, vice president; Joseph J. Ardigo, secretary-treasurer; Paul D. Ritter and J. M. Tulley, directors.

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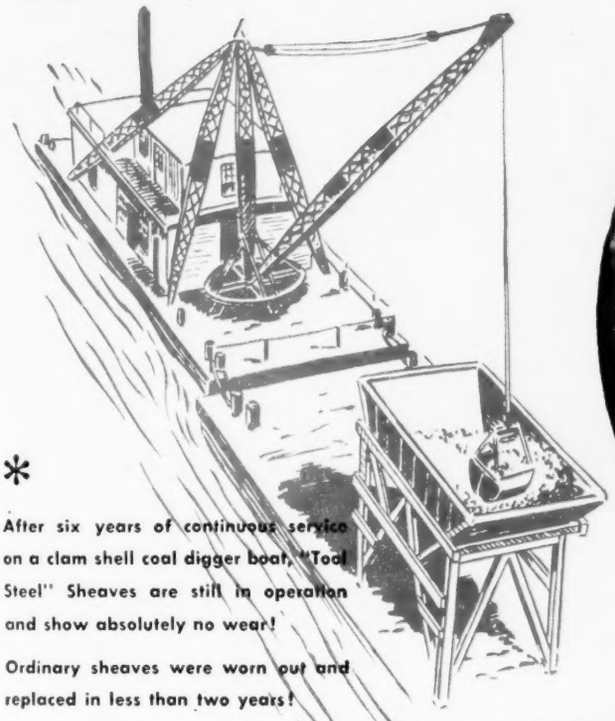
Coal Publications

Description of the Eickhoff-Schraemlader Longwall Coal-Cutting and Loading Machine, by Einor M. Arentzen. U. S. Bureau of Mines, I.C. 7390. 5 pp. plus 5 pp. of illustrations, 8x10½-in.; paper, mimeo,; free. Information about this wartime German development is limited to literature, photographs and drawings acquired by the Allied military occupation. Conclusions about its usefulness are tentative, but there appear to be promising possibilities.

Report on Coal Preparation. O. W. Roskill & Co. (Reports), Ltd., 14 Great St., London, S.W. 1; 1946. 87 pp., 8x13-in.; paper, mimeo.; 5 guineas ($21). An exhaustive study in three sections that appraises present preparation facilities for run-of-mine coals, technical problems governing the needs of British coal users and

3 TIMES* THE SHEAVE LIFE AND STILL NO WEAR!



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Ordinary sheaves were worn out and replaced in less than two years!

WITH "TOOL STEEL PROCESS" SHEAVES

ESTABLISHING trouble-free tonnage records is our business! And here is another typical example of why it pays to rely on "Tool Steel" hardened products:

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This service record as against that of ordinary sheaves of comparable costs, which were worn out in less than two years, provides many obvious substantial savings.

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economic relationships between preparation costs and the demand for prepared coals.

Applied Atomic Power, by E. S. C. Smith, A. H. Fox, R. T. Sawyer and H. R. Austin. Prentice-Hall, Inc., New York; 1946. 227 pp., 6x9-in.; cloth; $4. A geologist, a mathematician, an engineer and an industrialist review the development of atomic energy and possible applications for everyday needs including electricity and locomotive and marine propulsion. They forecast that the atom will supplement, not replace, conventional fuels.

Proceedings of a Housing and Heating Conference. Mineral Industries Experiment Station Bulletin 42, Pennsylvania State College, State College, Pa.; 1946. 166 pp., 9x11-in.; paper; price not quoted. The complete record of a three-day meeting in November, 1945, of representatives of 14 cooperating agencies—coal associations, engineers, architects and builders—to read and discuss papers on home design, heating and heating equipment, engineering, research and merchandising.

Treatment of Acid Mine Water for Breaker Use in the Anthracite Region of Pennsylvania, by L. H. Johnson. U. S. Bureau of Mines, I.C. 7382; 14 pp. plus 5 pp. of illustrations, 8x10½-in.; paper, mimeo.; free. Use of lime to reduce water acidity has reduced breakdown and maintenance and made possible the use of lightweight metals.

Coal Preparation Practice in Western Germany, by Thomas Fraser and M. G. Driessen. U. S. Bureau of Mines, I.C. 7389; 70 pp. plus 34 pp. of tables and illustrations, 8x10½-in.; paper, mimeo.; free. Mechanical developments that may be new in part include dedusting devices, flash and conveyor dryers, resonance screens, froth breakers and anti-breakage loading devices. Purifying methods include multiple-stage froth flotation, heavy-suspension and electrostatic separation, acid extraction of ash minerals and tar-oil extraction of coal matter.

A Mine Sewage Disposal Study, by R. T. Artz. U. S. Bureau of Mines, I.C. 7392; 8 pp. plus 2 pp. of illustrations, 8x10½-in.; paper, mimeo.; free. General description of sewage disposal underground and description of the method used in a limestone mine. Methane, hydrogen, carbon dioxide and hydrogen sulphide produced in septic tanks can cause explosions, suffocation, gas poisoning and oxygen deficiency. Eight precautions for installing and operating septic tanks are listed.

Radiant Heating, by T. N. Adlam. The Industrial Press, New York; 1947. 472 pp., 6½x9½-in.; imitation leather; $6. An engineer's working manual on the application of radiant-heating principles, construction, materials, controls and air venting for architects, contractors and builders. In addition, snow melting for driveways and airports, along with radiant cooling, is discussed. The last chapter has 64 charts covering pipe sizes, spacing and heat emission for various conditions, materials and floor coverings.

"Per Ton" Cost REDUCED

with

LINCOLN

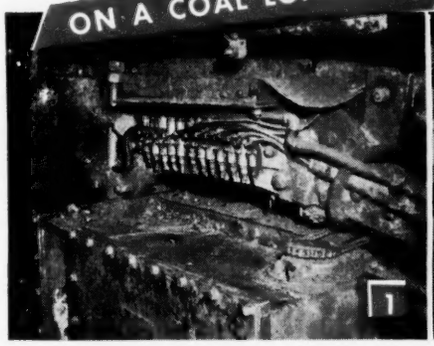
Single Line CENTRO-MATIC LUBRICATING SYSTEMS

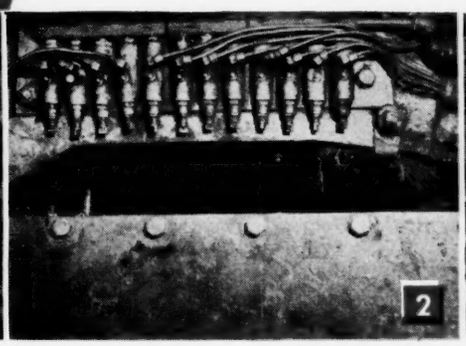
Year after year, in many mines, literally thousands of dollars are leaking away in lost production time, replacement parts, excessive maintenance labor, wasted lubricants, accident bills—troubles that so frequently are caused by faulty methods of lubrication.

These losses can be curbed, and production can be increased by installing Lincoln Centro-Matic Lubricating Systems.

There is a Centro-Matic System available for practically all types of coal mining machinery and equipment. The system consists of a suitable lubricant pump; an injector of proper capacity for each bearing; a single lubricant supply line connecting pump to injectors; and a tubing or flexible high-pressure hose connection from injector to bearing. Lubricant pumps are available in hand, air, or electrically operated models. Air and electrically operated pumps may be equipped with a time clock for fully automatic operation. Centro-Matic Systems are easily installed.

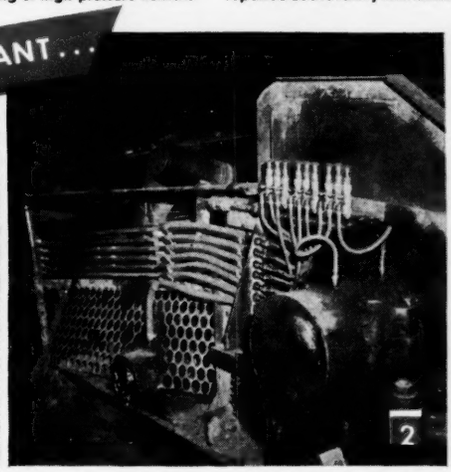
ON A COAL LOADER . . .

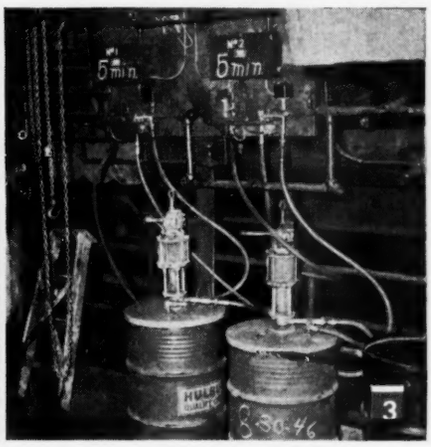




An automatic coal loader equipped with a Lincoln Centro-Matic System consisting of 51 adjustable injectors grouped in manifold, see photos (1) and (2). Each injector is attached to a bearing by copper tubing or high-pressure flexible hose and swivel. Lubricant pump has 22-lb. capacity and is powered by direct drive off the tramming clutch shaft, see photo (3). No bearing failure has been reported due to faulty lubrication since the original installation was made in 1944.

IN A COAL CLEANING PLANT . . .





This plant has 457 bearings to be lubricated, 27 of which are located on four sets of shakers. Two of the injector manifolds are illustrated, see photos (1) and (2). Over one and one-half million tons of coal passed over these shakers since the Centro-Matic System was installed and no time has been lost because of bearing failure. The Lincoln lubricant pumps are powered by 6" air motors and pump lubricants direct from original 400-lb. refinery containers. System is time clock controlled and operates at predetermined intervals ranging from 3 to 60 minutes, see photo (3).

Engineering Service

Our lubrication engineers are ready to assist you in solving your lubricating equipment problems to help reduce your "per ton" cost. We invite you to make use of this service, which is offered without obligation. The coupon at right will bring a representative or complete information.

LINCOLN

Pioneer Builders of Engineered Lubricating Equipment

LINCOLN ENGINEERING CO., ST. LOUIS 20, MISSOURI

Gentlemen:

We would like to have your representative call ☐. Please send me complete information on Lincoln Centro-Matic Systems ☐.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

CA 847-4

Preparation Facilities

Moffat Coal Co., Scranton, Pa.—Contract closed with Wilmot Engineering Co. for two 48-in. Wilmot hydroseparators to prepare broken and egg coal; total feed capacity, 100 t.p.h.

Lykens Coal Co., New Boston Junction, Pa.—Contract closed with Wilmot Engineering Co. for three Type D Wilmot Simplex jigs to prepare stove, nut and pea coal; total feed capacity, 60 t.p.h.

G. F. Keller, Port Trevorton, Pa.—Contract closed with Deister Concentrator Co. for two No. 7 SuperDuty Diagonal-Deck coal-washing tables for No. 4 buck.

Sickler Estate, Plymouth, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck coal-washing table for barley coal.

Duryea Anthracite Co., Packer colliery, Hudson, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty Diagonal-Deck No. 7 coal-washing tables, one for No. 1 buck and one for rice.

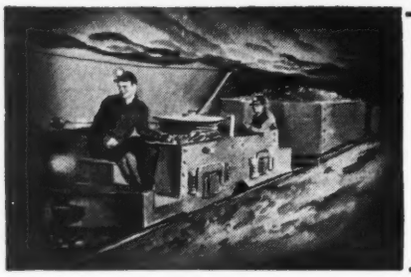
Blue Bird Coal Co., Harrisburg, Ill.—Contract closed with Jeffrey Mfg. Co. for complete washing plant; 185-t.p.h. raw-coal feed, 6x0-in.

Leckie Smokeless Coal Co., Anjean, W. Va.—Contract closed with Jeffrey Mfg. Co. for complete washing plant; 150-t.p.h. raw-coal feed, 1¼x0-in.

Valley Camp Coal Co., Moberly No. 1 mine, Elm Grove, W. Va.—Contract closed with McNally-Pittsburg Mfg. Corp. for washery addition for 110-t.p.h. of 2x⅜-in. and crushed 2x0-in. pickings; combined raw products to be washed in one 8-ft. McNally-Menzies cone separator, washed coals to be classified and dewatered into 2x⅜-in. and ⅜-in.x½-mm.; present run-of-mine screen being revised to facilitate hand picking of plus 5-in.; additional crushing facilities to permit crushing hand pickings to 2-in. minus through McNally-Pittsburg 24x24-in. single-roll crusher.

Snow Hill Coal Corp., Terre Haute, Ind.—Contract closed with McNally-Pittsburg Mfg. Corp. for complete tipple and washer, 600-t.p.h. capacity; washing 6x1¼-in. and 1¼x0-in. in two McNally-Norton automatic washers equipped with facilities to rewash middle-gravity fractions in McNally-Norton compound unit; after washing, coal will be sized to 6x4-, 4x2-, 2x1¼-, 1¼x¾-, ¾x¼- and ¼x0-in.; the ⅜x0-in. fraction of the ¼x0-in. washed coal to be centrifugally dewatered in McNally-Carpenter dryers; complete crushing facilities to crush plus 1¼-in. to minus 1¼-in., with rescreening facilities to provide minus 1¼-in. stoker grades.

National Resources Commission of China, Formosa—Contract closed with McNally-Pittsburg Mfg. Corp. for 50-t.p.h. preparation plant consisting of equipment to receive 10x0-in. run-of-mine, with facilities to crush to 1¼-in. minus prior to washing in one McNally-Norton automatic washer; washed 1¼-in. minus dewatered on vibrating screen at ¼mm.



Equipment News

More Detailed Information and Descriptive Literature Normally Are Available on Request Directly to the Manufacturer

Screen

Roe-Flat aggregate-wire screen designed to provide maximum metal surface for exposure to abrasive wear has been announced by John A. Roebling's Sons Co., Trenton 2, N. J. Its flat surface evenly distributes wear, according to the manufacturer, and increases screen life up to 90 percent above conventional-type screens. New methods developed for crimping, bending edges and welding make it possible to produce aggregate-wire screens with true precision openings—a feature in heavy-screen manufacture which has heretofore been difficult to obtain, it is said.

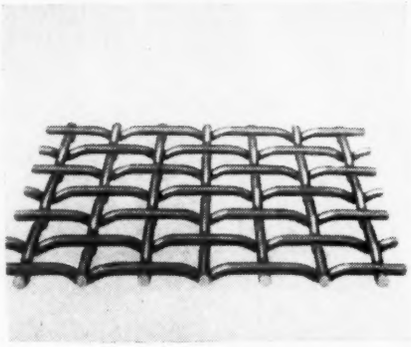
In operation the flat surface of Roe-Flat permits an even, smooth flow across the screening surface, tending to eliminate the clogging or blinding often found with screens made with surface crimps or knuckles, the manufacturer states. In addition, Roe-Flat is said to have proven to be the ideal supporting surface for fine-mesh-screen, its smooth top practically eliminating the spreading of wires and breaks usually caused by backing screens with uneven surfaces.

•

Blasting Timer

Development of the du Pont blasting timer, with which a series of dynamite charges can be fired at predetermined intervals as brief as five-thousandths of a second, has been announced by E. I. du Pont de Nemours & Co., Wilmington, Del. Such precise control, it is said, reduces ground vibration, gives greater fragmentation of coal or rock and enhances safety.

With the new blasting timer, it is possible to set a series of blasts—up to seven—following so closely upon one another that the ground vibration and the danger of damage from it that has restricted the size of the blasts and, consequently, their efficiency, are greatly reduced, according to the manufacturer. The timer consists essentially of a cam shaft driven through a solenoid-actuated clutch by a 110-volt synchronous motor. The shaft operates the contacts for completing 14 individual circuits at various predetermined time intervals. All contacts may be closed when the timer is in the off, or "ready," position, as indicated at an inspection window.



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Lubricant

A new lubricant said to fill practically all needs of cutting and loading machines, taking the place of two and sometimes three greases and oils, has been announced by the Gulf Oil Corp. under the name Gulf Mining-Machine Lubricant B.

This all-purpose product is a heavy bodied quality lubricant pioneered by Gulf technologists especially for cutting and loading equipment and it provides efficient lubrication for spur, worm and bevel gears, and for moving parts supplied through pressure fittings, according to the manufacturer. Special advantages cited are less mechanical leakage, longer life, greater tenacity and effective lubrication under water conditions. Its use to replace the several other lubricants usually required for mining machines greatly simplifies lubricant storage and handling problems.

•

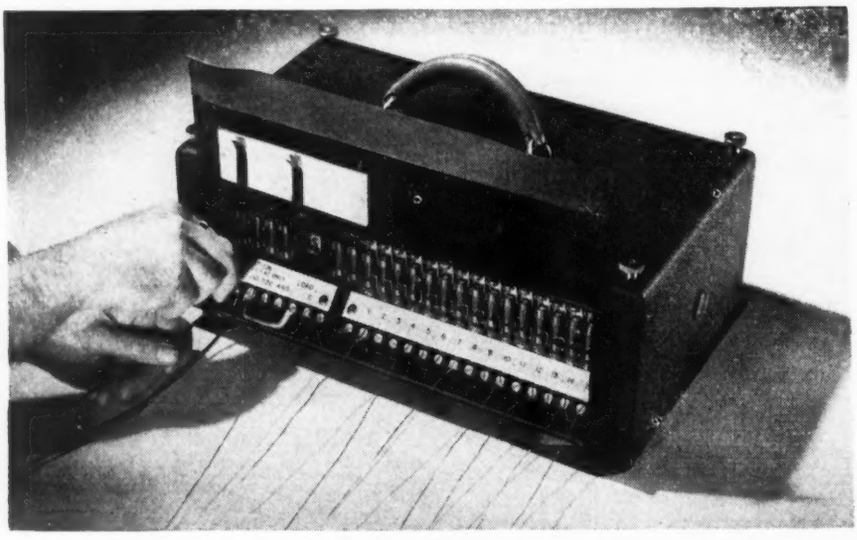
Earthmover

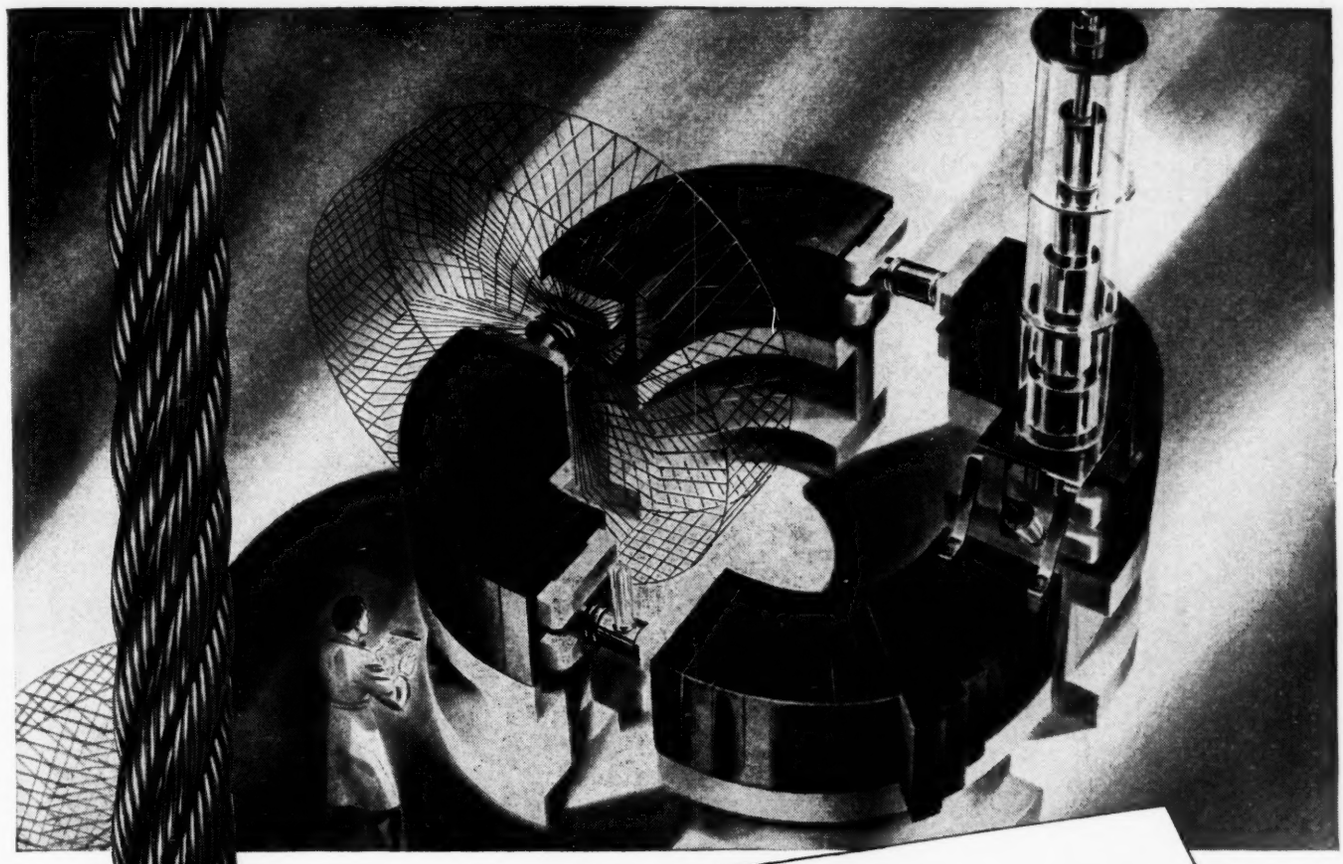
A new, small Model D Tournapull for high-speed dirtmoving has been developed by R. G. LeTourneau, Inc., Peoria, Ill. Powered by an 85-hp. gasoline engine, this prime mover is equipped with the new E-4 Carryall scraper, having a load limit of 4 tons and a struck capacity of 3.3 yd. The

unit is self-loading, has four speeds forward, four reverse, travels up to 23 m.p.h.

One of the outstanding features of this Tournapull, according to the manufacturer, is the new control by individual electric motors which replaces conventional tractor steering and gear-shift levers and also eliminates the need of a power-control unit for scraper operation. Operator steers, shifts and handles all scraper controls by buttons on the electric control panel. The Model D Tournapull also has a new-type differential that keeps both wheels pulling at all times and on slippery going the greatest power is supplied to the wheel on firmest footing, it is said. Neither wheel will spin independently of the other. Positive steering, another feature, enables the operator to lock the Tournapull and Carryall into a single unit and keep this unit traveling in a given direction. Air brakes also add to safe operation.

Ability to turn on a 25-ft. fill and to





Precisionbilt LIKE A SYNCHROTRON*...

J&L WIRE ROPE

PERMASET PREFORMED

Like a synchrotron,* J&L Precisionbilt Wire Rope is made to do its work and do it well. And, just as men of science look to the future J&L men are planning and working to produce an even better wire rope for you—wire rope that will give you increased service and reduce your maintenance costs. Specify J&L Precisionbilt Wire Rope for your equipment.

**A 300 million-volt synchrotron that will produce energy similar to that of cosmic ray particles is being constructed by scientists. It will go a step beyond atom-smashing to study sub-nuclear particles.*

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

turn in its own length from a full stop makes this small, fast rig extremely maneuverable, according to the company. Overall-dimensions are: length, 22 ft. 5 in.; height, 7 ft. 4 in.; wheelbase, 13 ft. 2 in.; width of cutting edge, 6 ft.; and weight, empty, 7½ tons.

•

Tires

A complete new line of truck tires known as the "Road Lug," designed for combination off-the-road and highway service, has been developed by the Goodyear Tire & Rubber Co., Akron, Ohio. Production of the "Road Lug" tire in sizes 7.00-20

through 12.00-24 already has begun and ultimately sizes 13.00-24 and 14.00-24 will be available.

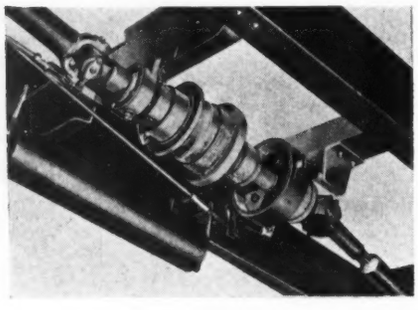
The tires are constructed with a rayon-cord carcass, tread and sidewalls with natural-rubber content equal to prewar tires of the same size according to the manufacturer. All sizes have multiple beads of high-carbon steel wire, and, it is said, the "Road Lug" tire resists cutting and bruising, provides traction in soggy going and, in addition, delivers exceptional mileage on improved highways.

•

Power Take-Off

Production on eight standard models of Davey heavy-duty power take-offs and formation of a new truck equipment division to handle power take-off engineering, production and sales has been announced by the Davey Compressor Co., Kent, Ohio.

The Davey power take-off uses, as its basic principle, an internal and external gear drive, operating as a strong and durable



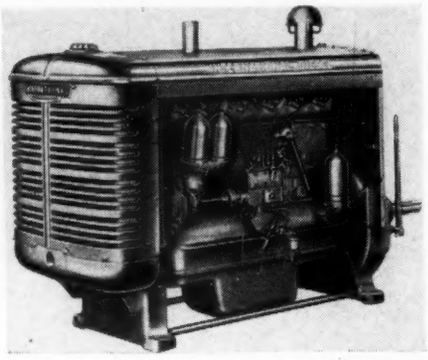
spline, and installation is made to the rear of the truck transmission case, according to the manufacturer. The power take-off becomes an integral part of the drive-shaft assembly for transmitting power direct from the truck engine either through V belts or chain drive. The eight models are available in 50-, 75- and 100-hp. capacities.

The Model 50 take-off is manufactured in both single and simultaneous-drive designs, with the latter permitting operation of truck, individual operation of driven equipment or both simultaneously. Models 75 and 100 are manufactured for single-drive, simultaneous drive and also for double drive. With double-drive take-offs, the truck may be operated alone, either of two pieces of driven equipment operated individually or both pieces of driven equipment operated simultaneously.

•

Diesel Engines

Production on a 125-hp. Model UD-18A power unit and a 76-hp. Model UD-14A unit has been begun by the International Harvester's industrial power division. Both power units are heavy-duty four-cycle diesels with the same bore and stroke, the UD-18A



with six 4¾x6½-in. cylinders and the UD-14A with four.

The UD-18A and UD-14A deliver considerably more power without increase in weight over the UD-18 and UD-14 models which they displace, according to the manufacturer. A new cylinder-head arrangement, improved nozzles, and redesigned precombustion chambers give them higher compression and greater efficiency in converting fuel energy into low-cost power, it is said. Since the International diesel starting system does not require preheating of the incoming air even in cold weather, it has been practical to locate the exhaust manifold on the injection side of the engine away from the intake manifold and, as a result, incoming air is said to be kept cooler. Ordinary lubricating oil of good quality is satisfactory for these engines because of their cooling and combustion characteristics. An oil control ring of a new type assures satisfactory cylinder lubrication without excessive oil consumption.

The engines are started on gasoline in the same manner as an ordinary gasoline engine. After a brief direct-flame cylinder warm-up, movement of a single lever changes the engine from the gasoline-starting cycle to four-cycle diesel operation with compression ignition. The UD-14A and UD-18A are available for many different kinds of jobs in a variety of equipment combinations.

Pump-Drive Motor

A new hollow-shaft vertical motor designed specifically for pump drives has been added to the line of General Electric Tri-Clad induction motors. Available in

ratings from 1 to 500 hp., all speeds and frequencies, the new motor is suitable for use on irrigation projects, deep-well turbine pumps, municipal and industrial water-supply projects, mine-dewatering pumps and process-industry liquid pumps, according to the manufacturer. For motors rated 10 hp. at 1,800 r.p.m. and larger, the new line features a system of controlled lubrication that allows just the right amount of oil to flow through the bearings, and thus prevents oil-friction loss caused by foaming and churning, it is said. Bearings are protected from rust even during standby periods because the oil level is above the top of the balls.

•

Welders' Goggle

The M.S.A. Speedframe, a self-adjusting welders' goggle that eliminates the waste motion and time of tiresome hand adjustment of goggles, has been announced by Mine Safety Appliances Co., Pittsburgh.

A nod of the head raises or lowers the goggles instantly, leaving both hands free for handling of work, it is said. The Speedframe consists of suitable goggles mounted in a lightweight fiber headframe of headline design, which holds the goggles securely in either position without uncomfortable pressure on the temples or the bridge of nose. It is made fully-adjustable in three directions by side and top straps and is held in the desired position by a simple screw-type clamp, according to the manufacturer. The Speedframe can be furnished with welders' or chippers' goggles —with or without Coverglas lenses, as desired.

•

Bulldozer Blade Bar

The Allied Steel Products, Inc., 7835 Broadway, Cleveland 5, Ohio, has announced a special steel bar for salvaging

Performance

L. RODMAN PAGE, PRESIDENT. SAMUEL A. CROZER, VICE PRESIDENT. JOHN J. LINCOLN, VICE PRESIDENT. EDWARD C. PAGE, SECRETARY & TREASURER

Page Coal & Coke Company
Miners and Producers
STANDARD POCAHONTAS COAL AND COKE
1510 CHESTNUT STREET
Philadelphia

July 26, 1946

MINES:
PAGETON, MC DOWELL CO
W. VA.

A TIMKEN BEARING ADVERTISEMENT BY Page

The Timken Roller Bearing Company,
Canton 6,
Ohio

Dear Sirs:-

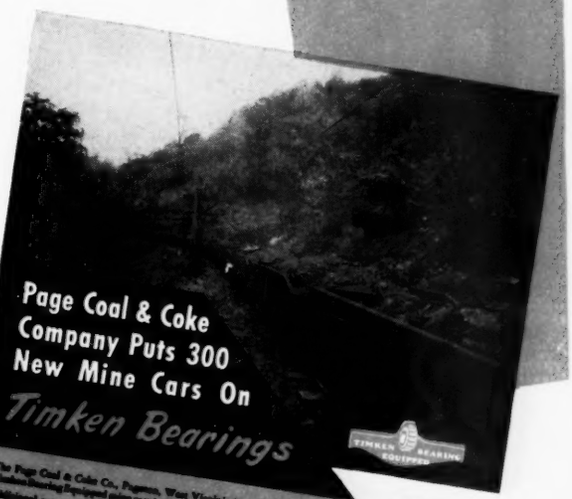
I have read with considerable interest your advertisement on the back of July Mechanization in regard to your roller bearings on the Page Coal & Coke Company's mine cars.

I thought it might be of additional interest to you to know that many of these cars are equipped with bearings taken from old cars, many of which are the originals which have been in use for over twenty years. We are now ordering another 100 cars, the bearings of which will all be taken from old cars, anywhere from 10 to 20 years old.

Sometime ago when I was at the mines this question came up, and according to their records we have never had a broken bearing, except in a wreck, since we have been using your roller bearings. This we consider quite a record.

Yours very truly,
C. Edward Page
President

ERP-K.



Page Coal & Coke Company Puts 300 New Mine Cars On Timken Bearings

The Page Coal & Coke Co., Pageton, West Virginia bought their first Timken Bearing Equipped mine cars in October, 1925—over 20 years ago. Additional cars were added beginning 4 months later resulted in the complete replacement of their plain bearing cars with Timken Bearing cars by 1951. At that time they had 500 Timken Bearing Equipped cars in service. The operation of these cars: (1) increased coal output per loaded car 20%; (2) reduced car lubrication costs 86.9%; (3) reduced car maintenance costs 84.5%; (4) reduced much maintenance labor to a minimum; (5) reduced power consumption per ton hauled. The above facts, and many others equally gratifying, were revealed in an impartial survey made by the A. C. Nielsen Company of Chicago and New York, a widely known and respected independent industrial research organization.

Last year the Page Coal & Coke Co. took another big step forward in cutting haulage economy by purchasing 300 new Timken Bearing equipped, all-steel mine cars of greater capacity than any cars they have previously used. These cars, some of which are shown in the photograph, were built by American Car & Foundry Company, Huntington, W. Va.

Only genuine Timken Bearings can give you these Timken Bearing advantages. Look for the trade-mark "TIMKEN" on every bearing you specify in your equipment. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST —◫— LOADS OR ANY COMBINATION —✳—

bulldozer, drag and maintainer blades. Known as the "Re-Nu Edge" Bar, it can be welded to the square or worn edge of the blade with an all-purpose high-grade steel electrode, such as an AWS 6012 or 6013. To prevent wear on the weld, this bead is then covered with a thin layer of hard-surfacing electrode, according to the manufacturer. The same material also is used around the ends or corner castings where the most severe wear takes place. This work-hardening steel edge will prolong the life of the blade many months, thereby effecting considerable savings in the cost of blade replacements.

•

Tire

Substituting high-tensile steel wire for cotton and rayon cord, the Firestone Tire & Rubber Co., Akron, Ohio, is now producing what their engineers believe to be the strongest pneumatic tire ever built—the Wire Cord tire. Stated to be ideal for use in mining and other industries where trucks must negotiate rough off-the-highway roads and then speed their heavy loads over modern thoroughfares, the Wire Cord tire has proved itself superior to any existing

heavy duty tire, according to the manufacturer. It runs cooler under heavy loads at high speeds, it has never been known to blow out, it gives greatly increased mileage and, because of its great body strength, can be recapped several times, it is said.

The present Wire Cord tire is built up of plies of rubberized wire cord in the same manner as the conventional cotton or rayon cord. With the exception of the original ply preparation, the same machinery and fundamental tire-building methods are used. However, because of the greater strength of the wire cord, fewer plies are required than with cotton or rayon, it is said. The wire cord is but 0.036 in. in diameter. It is composed of several strands of wire 0.0058 in. in diameter, only slightly larger than a human hair, twisted together. The Wire Cord tire can be readily repaired by conventional tire-repairing methods.

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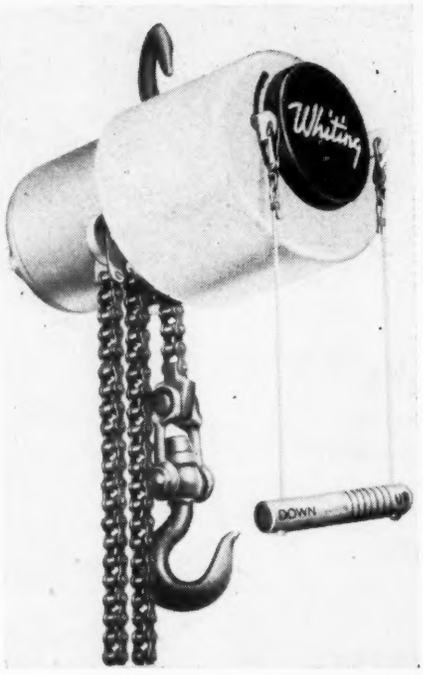
Electric Hoists

A new line of roller-chain electric hoists in ¼-, ½- and 1-ton capacities has been announced by the Whiting Corp., Harvey, Ill. The 1-ton hoist weighs only 87 lb.,



light enough so that one man can install it or move it without assistance, it is said.

The new hoist utilizes a simple double-reduction totally inclosed worm-gear drive, which makes possible the hoist's compactness and light weight, it is said, and reduces the number of wearing parts. Precision ball bearings are used throughout and the hoist frame is a steel casting. A patented self-energizing motor brake, which does not require adjustment, interlocks with the controller to provide safe operation and upper and lower safety limit switches are provided, according to the manufacturer.

The alloy-steel roller chain operates over an extra large sprocket, assuring smooth operation and reducing chain wear. The load hook has a universal action and swivels on ball bearings, which prevents the roller chain from twisting. Control is by means of a single-bar grip, which can be operated by one hand.

•

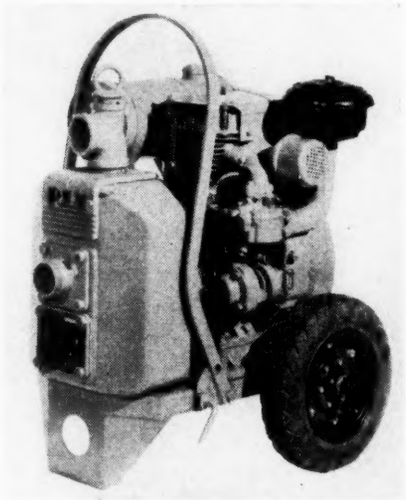
Circuit Breaker

A new Quicklag circuit breaker that provides several new refinements, chief of which is a new tripping action that combines the inverse-time-limit characteristics of Bimetal thermal action on overloads with the operating speed of magnetic trip action on short circuits, has been announced by the Westinghouse Electric Corp., Pittsburgh 30.

Available in single or double pole, 10 to 50 amp., 125 to 125/250 volts a.c., the new breaker is said to provide another important improvement, a redesigned "De-ion" arc chute that eliminates the need for a vent screen in the bottom, thereby permitting mounting flush to pan. This eliminates need for the ⅜-in. mounting clearance formerly required. Other improvements, according to the manufacturer, include: a sturdier operating handle more inclosed than the old; internal design requiring less handle movement; hole in handle permitting more satisfactory method of attaching handle extension for two-pole operation; and smooth flush surface to eliminate dust.

Centrifugal Pump

Chain Belt Co., Milwaukee, has announced production of a new line of Rex Press-Formed self-priming centrifugal pumps, which are said to combine attractive appearance with many features of construction that are unique in self-priming centrifugal-pump design. The pump body is press-formed of Armco Ingot iron, highly resistant to corrosion, and there is a great saving in weight, according to the manufacturer. In the 2-in. size, for example, the new Rex weighs 90 lb. less than the former cast-iron design.



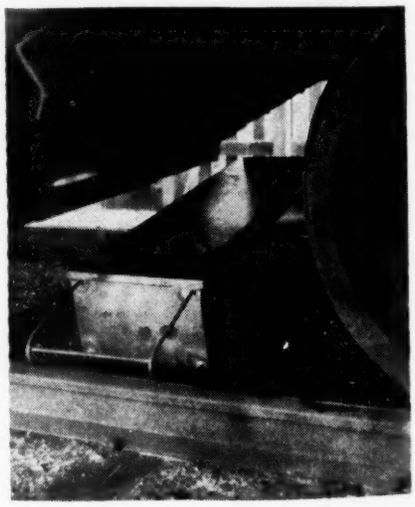
Pumping efficiency has been improved because, in part, of the smooth surface of the pump and press-formed volute, which results in a smoother flow of water through the pump, reduces friction and thus betters performance, it is said.

•

De-Icer

A coal de-icer that is said to apply heat to the entire width of a railroad car at one time and that can be handled by one man, is being produced by J. C. Corrigan Co., 41 Norwood St., Boston 22, Mass.

The de-icer is placed under the railroad car pocket and filled with waste or No. 2 fuel oil or kerosene, which is ignited to heat the width of the car. Use of a unit under each pocket at the same time is recommended by the manufacturer.



Barber-Greene

FIRST! because they LAST!

The on-the-job lasting ability that identifies B-G Standardized Belt Conveyors is in large part due to these B-G all-welded tubular steel belt carriers. Protected from dust and grit by "four-pass" grease seals, their bearings—roller, ball or plain as the job requires—keep them rolling smoothly with minimum maintenance.

Heavy die-formed support brackets are welded to the self-cleaning base. And along with Barber-Greene sturdiness, B-G Belt Conveyors bring you the advantages of standardized design: selection of the right one for the job and erection on the job are simplified. See your Barber-Greene distributor or write Barber-Greene Company, Aurora, Illinois

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

BUCKET LOADERS • BELT CONVEYORS • PORTABLE BELT AND FLIGHT CONVEYORS • CAR UNLOADERS • SNOW-LOADERS • COAL LOADERS

Respirator

The improved M.S.A. Clear-Vue Dustfoe respirator combines greater wearing comfort and better appearance with complete breathing protection—U. S. Bureau of Mines approved—against every type of nuisance or harmful dust, according to the Mine Safety Appliances Co., Pittsburgh, Pa.

The M.S.A. Clear-Vue Dustfoe has a facepiece of formable aluminum which insures a comfortable fit on any face, while a soft flexible face cushion provides a dust-tight seal, it is said. The filter container is made of tough, transparent plastic, permitting visual check of filter position, type and condition. The single, throwaway-type filters are colored to facilitate instant recognition.

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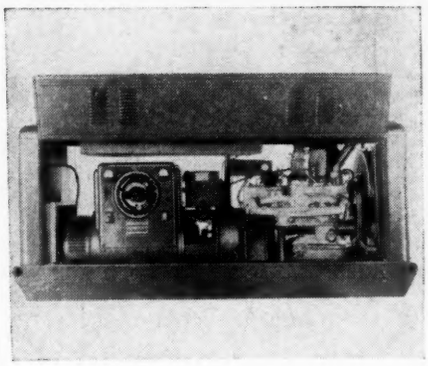
Arc Welder

A compact combination-drive welding machine consisting of a standard 300-amp. generator and 20-h.p. induction motor mounted on a heavy solid shaft coupled to a Chrysler 6-cylinder industrial engine through an over-running clutch coupling has been announced by The Hobart Bros. Co., Troy, Ohio. The coupling allows the gasoline engine to drive the welding generator positively, but should the gasoline engine be stopped and the generator be driven by the electric induction motor, the clutch will automatically over-run, or free wheel, according to the manufacturer.

The induction motor is wound for dual



voltage 220/440 and the changeover is accomplished by throwing a double-throw knife switch, with no changes necessary in the contactor for 220-volt or 440-volt operation. The unit carries all the features of the standard Hobart 300-amp. electric-driven machine as well as the gas drive, it is said, plus the over-running clutch coupling and the 220/440-volt changeover switch. With this unit, the operator is able to take advantage of the cheapest power available and should the electric power fail because of line failure, or overload during a peak-load operating point, the gasoline engine is immediately available.

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Tool Kits

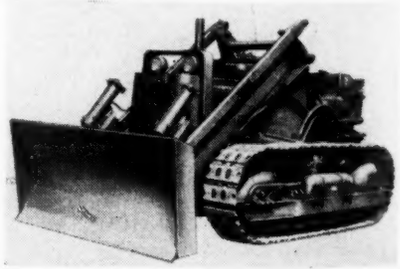
The seven Hallowell speed tool kits recently announced by the Standard Pressed Steel Co., Jenkintown, Pa., are both lightweight and rugged and replace well over a hundred tools, since all told they contain 50 tools and three of the kits have swivel bit-chucks which provide five different driving or wrenching positions, according to the manufacturer.

The interchangeable tools carried in hollow Celanese plastic handles are of high-grade alloy steel, precision made according to standard specifications. The kits are designed to be applicable to most general fields and, in a few instances where the demand was great, were designed, upon request, for specialized industries and concerns. Each kit will fit in the palm of a hand.

•

Bulldozer-Shovel

Frank G. Hough Co., Libertyville, Ill., has announced the new Model 9-A bulldozer-shovel, specifically built into the International T-9 and TD-9 TracTracTor. The Model 9-A is a dual purpose unit and may be equipped with either a full-track-width 1-yd. bucket or bulldozer blade. Since it was specifically designed and built into



STEP BY STEP QUALITY

is the result of Process Control all the way!

Examine a piece of Rome 60 Mining Cable STEP BY STEP and observe its inherent qualities. From inner conductors to outer molded sheath, each process of its manufacture is the result of controlled workmanship.

ROME 60
Four-Conductor Power
Cable—Type W.

1. Precision formed, extra flexible *copper* conductors.
2. Uniformly concentric and homogeneous rubber insulation.
3. Center filler of specially compounded Neoprene.
4. Core completely filled and surrounded with Neoprene.
5. Reinforcing braid tightly applied for greater adhesion and durability.
6. Molded RoPrene (neoprene) sheath, flame-resistant and dimensionally correct.

Designed for hard use in mines under hazardous conditions, toughness plus safety is assured in Rome 60 Cables by careful selection of acceptable materials and process inspection throughout its manufacture. Inspectors, trained in their jobs and with no obligation to production urgencies, watch it ALL THE WAY. You can specify Rome 60 with confidence.

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

ROME • NEW YORK

the tractor, the original tractor balance, stability and traction are maintained with either blade or bucket, according to the manufacturer.

The bucket is raised, lowered, dumped and relatched entirely by hydraulic control, eliminating practically all physical effort by the operator. Overhead and side structures are eliminated, contributing to full 360-deg. visibility while digging, carrying or dumping, as well as assuring better balance and stability, with reduced wear on front track rollers and idlers, it is said. A long, high-dumping reach is provided for dumping into trucks, hoppers, etc. Unique design of push-arms provides a powerful crowding action in the digging range and fast hoisting action thereafter.

Oil-Seal Packing

A new type of oil-seal packing has been developed by the Johns-Manville Corp., New York 16, N. Y., for the protection of bearings. The new product, known as Clipper Seal, uses no metal and is made with a heel of resin-bonded fabric giving it the rigidity essential for a press fit in the cavity and with a lip of a tough but soft flexible compound. The special lip design makes it possible to vary the bearing area and control the pressure of the lip against the shaft by means of a garter spring, thereby reducing shaft wear to a minimum, according to the manufacturer, while the one-piece precision-made body, concentrically molded and nonmetallic in construction, permits relatively liberal machining tolerances.

In service, these features are said to provide a positive lubricant-retaining dirt-excluding seal, automatic in operation, adaptable to a wide range of conditions and highly resistant to most forms of corrosion. Clipper Seals are made in sizes for shafts from $1\frac{5}{16}$- to 37-in. diameter, in both endless and split types. Special designs are available where unusual temperature, pressure or chemical conditions require.

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Hose

. "Black Wing" cord line water and air hose, said to feature a body structure based on a new manufacturing principle, has been announced by the Goodyear Tire & Rubber Co., Mechanical Goods Division, Akron, Ohio. Horizontal braiding, with an exclusive method of bonding cover, carcass and tube together, give the new hose rope-like flexibility and yet retains maximum ruggedness, according to the company.

Designed to stand up under extreme "on-the-job" punishment, the water hose is expected to prove particularly adaptable for construction operations requiring a kink-less easily handled conduit. It is built in $\frac{3}{4}$- and $2\frac{1}{2}$-in. sizes. Said also to be highly flexible, "Black Wing" air hose is manufactured in two types—two-braid standard for pneumatic-tool service and three-braid heavy duty for air-drill usage. Sizes range from $\frac{3}{8}$- to $1\frac{1}{2}$-in.

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Industrial Notes

Jones & Laughlin Steel Corp. has elected Admiral Ben Moreell, former Coal Mines Administrator, chairman of its board of directors and executive committee and president of the corporation. Admiral Moreell, who retired from the Navy last September to become president of the Turner Construction Co., also will continue in that post until June 1, when he will become a director of the Turner Construction Co.

Cummins Engine Co., Inc., Columbus, Ind., has elected V. E. McMullen executive vice president and R. E. Huthsteiner, vice president and general manager. Mr. McMullen was formerly vice president and general manager and Mr. Huthsteiner vice president, assistant general manager and controller. The appointments of Leonard W. Beck as general sales manager and Waldo M. Harrison as controller, also have been announced.

Goodyear Tire & Rubber Co., Akron, Ohio, has announced that Cliff Slusser has resigned as vice president in charge of production and as a member of the board of directors. Mr. Slusser, who joined the company in 1911, will continue as vice president and general manager of the subsidiaries which operate Goodyear's textile plants and coal mines. Russell DeYoung, who succeeds Mr. Slusser, was formerly vice president and general manager of

They Clear Our Path to Bigger Profits!

When it comes to stripping overburden, those Oliver "Cletrac" crawler tractors are in a class by themselves. The way those babies handle themselves in that rough going is a sight to behold. They really get us down to the seam in a hurry.

My Oliver "Cletrac" dealer was the boy who gave me the dope on stepping up production. "Look," he said, "when you're dozing or scraping off that overburden, you get an uneven load on the tractor. So you've got to keep jackknifing from side to side to overcome the uneven pull. That is, unless you've got Cletracs on the job. They have an exclusive steering principle that permits them to balance the pull of one track against the pull of the other. You can keep an offset load moving straight ahead . . . there's no wasted motion. And, they are easier and safer to handle on rough, steep and uneven ground."

He had the right angle, all right. Why we've cut our clearing time right down to the bone. The Oliver "Cletrac" dealer sure knows this stripping business. He's a good man to know!

OLIVER
Cletrac
SALES
SERVICE

Cletrac
a product of
The OLIVER Corporation
Industrial Division: 19300 Euclid Ave., Cleveland 17, Ohio

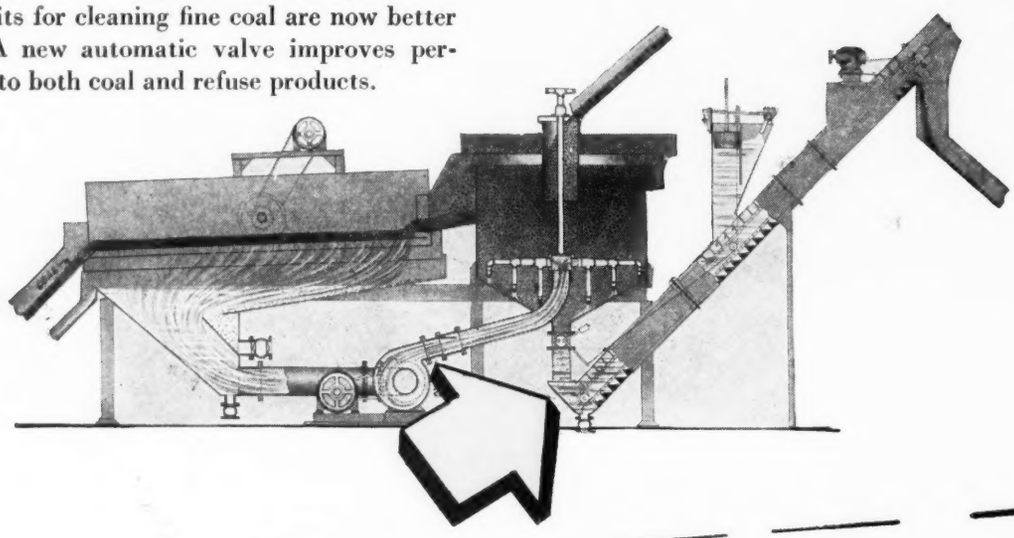
"THE SIGN OF EXTRA SERVICE"

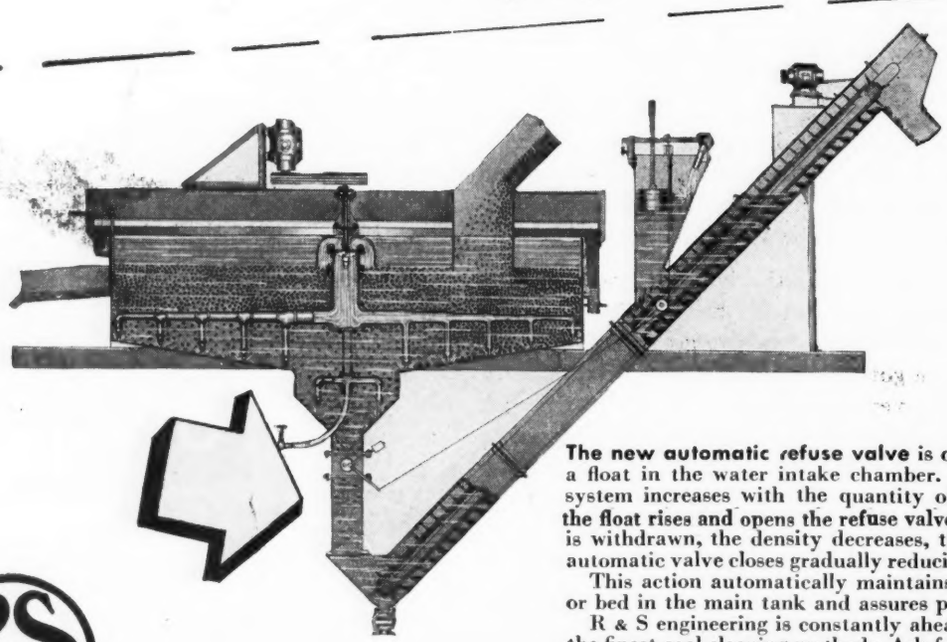
NEW ... Improved

R&S HYDROTATOR and CLASSIFIER UNIT

with automatic refuse valve

The popular R & S Hydrotator and Hydrotator Classifier units for cleaning fine coal are now better than ever. A new automatic valve improves performance as to both coal and refuse products.





The new automatic refuse valve is operated by cable from a float in the water intake chamber. As the density of the system increases with the quantity of refuse in suspension the float rises and opens the refuse valve. In turn, as the refuse is withdrawn, the density decreases, the float drops and the automatic valve closes gradually reducing the refuse discharge.

This action automatically maintains a constant "bottom" or bed in the main tank and assures peak performance.

R & S engineering is constantly ahead of the demand with the finest coal cleaning methods. Ask for descriptive bulletins. Make your coal worth more.

R AND S COMPANY

ROBERTS and SCHAEFER CO.

307 North Michigan Avenue, Chicago

2221 Oliver Building
PITTSBURGH 22, PA.

P. O. Box 570
HUNTINGTON, W. VA.

Goodyear Aircraft Corp., a subsidiary. Fred W. Climer, formerly assistant to the president, has been named vice president in charge of industrial relations.

Mine Safety Appliances Co., Pittsburgh, has named C. M. Donahue manager of its mining department. He has been associated with the company in several important capacities since first joining it in 1927 as Buffalo district representative. In 1928 Mr. Donahue became assistant sales manager, in 1933 assistant manager of the mining department and in 1946 manager of the sales-engineering and planning department.

B. E. Schonthal & Co., Inc., Chicago, marked its first quarter-century of business on Jan. 13. Bela E. Schonthal is president and Joseph Schonthal secretary of the organization.

Reliance Electric & Engr. Co., Cleveland, has elected Fred E. Harrell, formerly general works manager and director, manufacturing vice president of the company. Mr. Harrell joined Reliance in 1924 and was named general works manager in 1945. A. R. Hough has been named a southern sales representative for the company, with headquarters in Knoxville, Tenn., succeeding Arthur L. Pollard, retired.

American Car & Foundry Co., New York, has announced that F. J. Bogard, formerly sales agent for the mine-car sales division, at Huntington, W. Va., has been assigned new free-lance sales duties covering the entire bituminous coal region. Mr. Bogard has been with ACF since 1922 and was appointed to the Huntington mine-car sales division in 1936. C. C. Murphy has been named to succeed Mr. Bogard. Before joining ACF in 1943, Mr. Murphy served as sales engineer for Mountain State Steel Foundry, Parkersburg, W. Va., and the Massillon Steel Castings Co., Massillon, Ohio. ACF also has appointed T. C. Ballou manager of welded-products sales. Mr. Ballou became associated with ACF as sales agent in its Cleveland Office in 1936, and in December, 1936, was transferred to the New York sales office as a sales agent in the tank-car department. Since returning from war service, he has worked closely with the development of the company's welded-products division.

Marion Power Shovel Co., Marion, Ohio, has named M. V. Cornell sales manager, succeeding Walter N. Westland, who recently resigned to join the sales organization of the Cummins Engine Co., Inc. Mr. Cornell has been associated with Marion since 1938, in charge of sales in eastern Ohio and western New York States, except for three years war service.

Kennametal Inc., Latrobe, Pa., has appointed R. T. Smith, Glenshaw, Pa., a sales representative in Pennsylvania.

Electric Railway Equipment Co., Cincinnati, has announced that G. K. McKee, formerly with the Avey Drilling Machine Co., Covington, Ky., has assumed ownership as president and treasurer. Other new officers include A. L. Johnston, vice presi-

dent and secretary, and J. E. Eshelby, assistant secretary-treasurer.

Pittsburgh Gear & Machine Co. has announced that Joseph C. "Mike" O'Brien, chief engineer of the company, which he helped found in 1915, died suddenly in his home in Pittsburgh Jan. 25. Mr. O'Brien, who, prior to the organization of Pittsburgh Gear, was for many years associated with the Nuttal Gear Co., enjoyed a national reputation as a mathematician and authority on gear engineering and design, and numerous developments and innovations in gearing arts are attributable to him. He was one of the founders of the American Gear and Manufacturers' Association and, up to the time of his death, was a member of its committee on standards.

Euclid Road Machinery Co., Cleveland, has named W. W. Paape, formerly district representative in Chicago, domestic sales manager, effective March 28. Mr. Paape has been active in the construction industry for over 20 years. E. E. Armington, former sales manager, will devote the major portion of his time to executive and management duties as secretary of the company.

Electric Storage Battery Co., Philadelphia, has appointed C. J. Moore, formerly assistant manager of the Pittsburgh branch, manager of that branch, succeeding W. B. Bowie, who has been named manager of railway and engineering sales in Philadelphia.

Marquette Mfg. Co., Inc., Minneapolis 14, Minn., is offering free of charge to interested groups the "Marquette Story," a new 16-mm. full-color sound movie, which presents action shots of the construction and utilization of Marquette "Instant Arc" welders.

Raybestos-Manhattan Inc., Passaic, N. J., has opened a consolidated office in Cleveland at 1071 Union Commerce Bldg. Divisions of the corporation represented at this office are: Manhattan Rubber Division, T. Robinson; Asbestos Textile & Packing Division, D. E. Cow; and Equipment Sales Division, Raybestos-Manhattan, Inc., and the United States Asbestos Division, E. E. Juergens.

Electric Products Co., Cleveland, has established a Cleveland district office with headquarters at the factory, 1725 Clarkstone Rd. The new district is to be headed by G. J. Doss and will include western New York and Pennsylvania, Ohio, West Virginia, Kentucky and Tennessee.

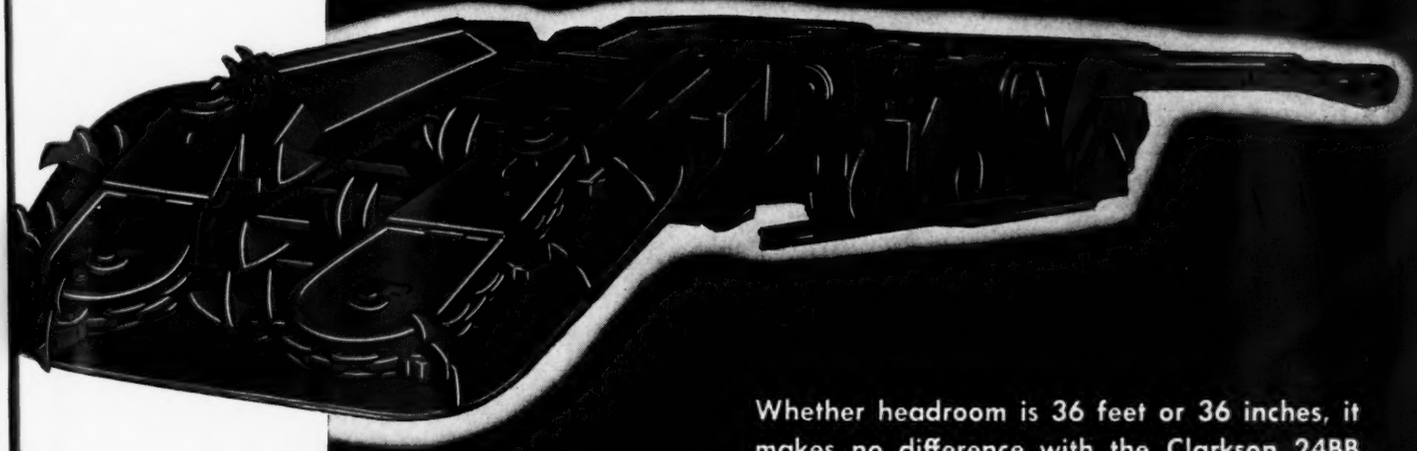
Joseph T. Ryerson & Son, Inc., Chicago, has appointed Charles S. Hegel manager of its stainless-steel division, and John W. Queen manager of its alloy-steel division. G. Van Dyke, formerly head of the Ryerson special-steels division, has retired after 30 years of service with the organization. Mr. Hegel joined the company in 1928 and became manager of the special-steels department at the Chicago plant in 1945. Mr. Queen joined the Ryerson sales staff in 1933 and was appointed manager of the alloy-steel department at New York the following year.

For LOW COAL and HIGH COAL

there's faster loading and better clean-up with

The CLARKSON

TYPE 24 BB
UNIVERSAL *Redbird*



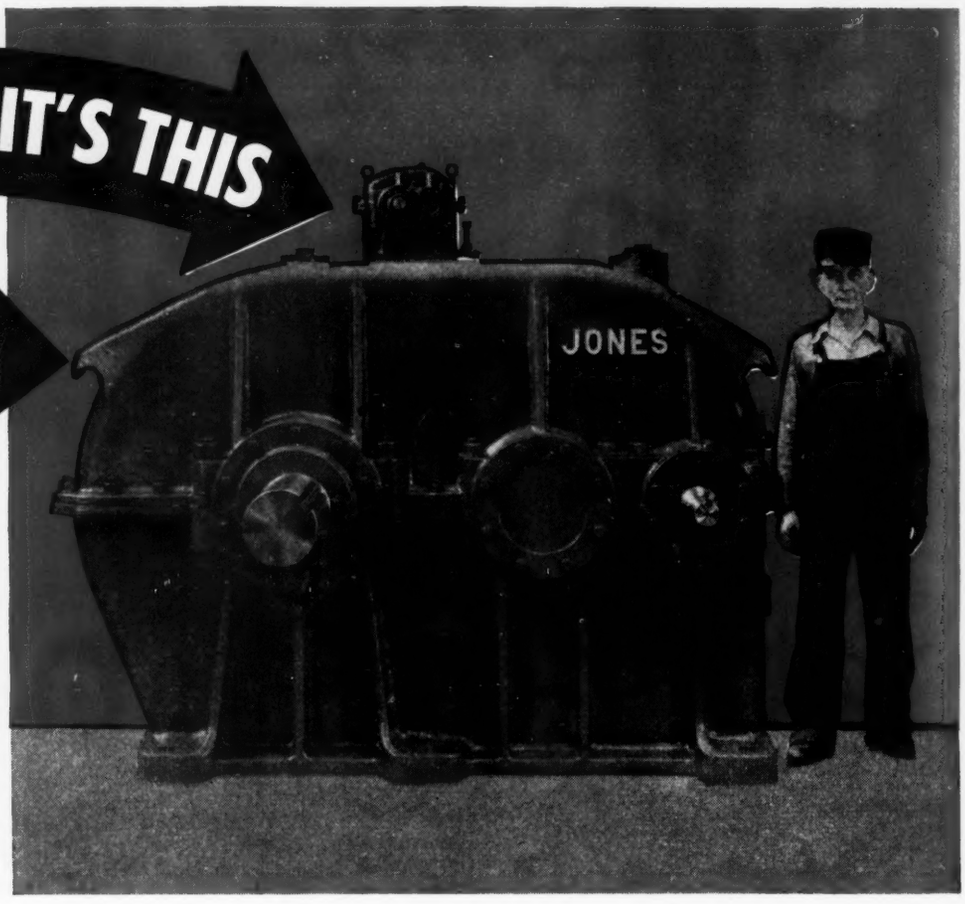
Whether headroom is 36 feet or 36 inches, it makes no difference with the Clarkson 24BB Universal Loader on the job. Highly flexible—with vertical or horizontal adjustment. The digging head gets those tight shots—it's the *lowest* loading machine on wheels.

The efficient Clarkson Redbird does the job faster, better and at low cost. Operated from one central point.

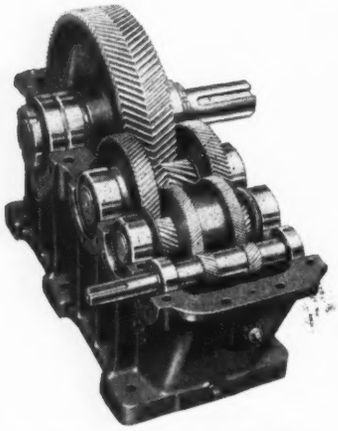
Send for detailed information . . .

The CLARKSON
MANUFACTURING CO.
Nashville
Illinois

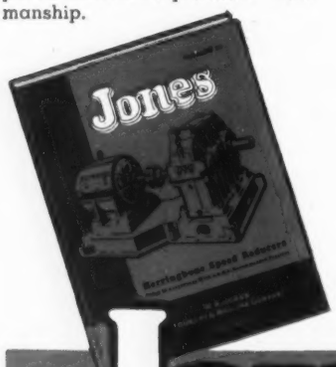
WHETHER IT'S THIS —OR THIS



. . . both are designed and constructed to give satisfactory service and long life



The above view of a Jones Triple Reduction Herringbone Speed Reducer is typical of a line that is noted for advanced design, superior materials, precision workmanship.



TWENTY FOUR hours a day operation plus loading up to rated capacity or beyond are testing speed reducers in every type of service.

Jones Herringbone Speed Reducers are establishing remarkable service records under these conditions. One reason of course is the fact that Jones Reducers have always been rated in accordance with the recommended practice of the American Gear Manufacturers Association.

With this conservative rating policy goes sturdiness, compactness, symmetry and balance—all factors that influence maximum efficiency, long life and improved performance.

Jones Herringbone Gear Speed Reducers are built in a wide range of ratios and ratings to cover every requirement. Single (Type SH) reducers in standard ratios range from 1.25 to 1 up to 11 to 1 in ratings from 1.3 to 440 H.P. Double (Type DH) reducers are built in standard ratios from 10.9 to 1 up to 72 to 1 in ratings from 0.5 to 275 H.P. The triple reduction reducers (Type TH) cover a range of ratios from 86.9 to 1 up to 355.8 to 1 in ratings from 0.3 to 78 H.P.

All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Cast iron bases are available for all variations of motor assembly.

For complete information on both standard and special applications of Jones Herringbone Reducers ask for Catalog No. 70. This 128 page catalog is a comprehensive technical treatise on the whole subject of Herringbone Reducer application for all conditions of service. If you have any type of drive problem that might call for Herringbone gears we shall be pleased to send you a copy.

W. A. JONES FOUNDRY & MACHINE CO., 4401 Roosevelt Road, Chicago 24, Ill.

Jones

HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • PULLEYS • GEARS • V-BELT SHEAVES • ANTI-FRICTION PILLOW BLOCKS • FRICTION CLUTCHES • FLEXIBLE COUPLINGS

Elastic Stop Nut Corp. of America has elected John R. Munn, previously president, chairman of the board, and William F. McGuinness, formerly vice president and treasurer, president. Mr. Munn succeeded John F. Casey Sr., who retired as chairman after being connected with the industry from its inception. Mr. Casey was succeeded as a director by his son, John F. Casey Jr., Pittsburgh.

Portable Products Corp., Pittsburgh, has opened new general sales offices occupying the entire 41st floor of the Woolworth Bldg., New York. Among the several hundred guests at the formal opening Feb. 18 were Col. Allen M. Pope, president of the Commerce and Industry Association of New York, and the Hon. Grover A. Whalen.

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Trade Literature

AVAILABLE WITHOUT CHARGE ON REQUEST TO THE MANUFACTURER

Aerial Power Cable—Okonite Co., Passaic, N. J. Bulletin No. OK-1033 illustrates and describes Okolite-Okoprene self-supporting aerial cables and contains sag and tension data, weights, current-carrying capacities, ice and wind loadings and other engineering data. Actual installations and recommended methods of installing, tapping and splicing self-supporting cable also are covered, with special emphasis on the new "Line-Tap" construction which allows one conductor to be tapped while the cable is "hot."

Insulating Varnishes—Chemical Department, General Electric Co., Pittsfield, Mass. Booklet offers complete technical and application data on G-E insulating varnishes and includes specifications, electrical properties, film properties, cure and aging, chemical properties and baking and air-drying cycles for each type. Types consist of black baking, black air drying, clear baking, clear air drying, black baking and air drying, clear baking and air drying, sticking varnishes and air-drying and baking enamels. Thirty-six grades are described.

Oil Circuit Breakers—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Bulletin No. 71B6421 describes the features of the Allis-Chalmers FZO-150 Unitop frame-mounted fabricated three-pole high-voltage oil circuit breaker in ratings from 15,000 to 46,000 volts and includes outline dimensions with weights and oil volumes for reference.

Diesel Engines—Cummins Engine Co., Inc., Columbus, Ind. First post-war edition of "The Dependable Diesel" magazine contains pictures and stories of nearly 100 varied installations of Cummins diesel engine in various industries. A complete account of the steps the company took in testing America's first successful high-speed diesel engine and the story of the Cummins sales and service network are featured.

V-Belts—Quaker Rubber Corp., Philadelphia 24. Folder lists the new Quaker line of multiple and fractional-horsepower V-belts and includes sizes and prices.

Ball Bearings—Dodge Mfg. Corp., Mishawaka, Ind. Bulletin No. A-120 describes the new line of SC ball bearings and provides engineering information on pillow blocks, hanger bearings, flanged units, take-up units and cylindrical units, as well as steel-frame ball-bearing take-ups. Selection tables offer a convenient means of selecting the right bearing for an application.

Floor Resurfacer—Stonhard Co., 403 North Broad St., Philadelphia 8. "Over Ruts and Holes" outlines the overlaying or patching of worn concrete, wood, brick or composition floors with Stonhard Resurfacer. Several typical installations on traffic aisles, floors, platforms and outside ramps are described and illustrated, and uses and application are explained.

Suction Hose—Hewitt Rubber Division, Hewitt-Robins, Inc., 240 Kensington Ave., Buffalo 5, N. Y. Folder illustrates Monarch water-suction hose recommended for all heavy-duty pumping operations.

Packing Rings—Asbestos Textile & Packing Division, Raybestos-Manhattan, Inc., Manheim, Pa. Bulletin No. A-909 describes "VEE-FLEX" packing rings, said to be automatic in action and designed for obtaining maximum sealing qualities with finger-tight gland compression. They are especially recommended for use in rams, hydraulic lifts, etc., against hot and cold water, steam, gasoline, oils, air and acids.

Hydraulic Jacks—Blackhawk Mfg. Co., Milwaukee 1, Wis. Catalog No. J-46 lists hand jacks up to 100-ton capacities, gage-equipped jacks and wheeled floor jacks.

Hydraulic Portable Power Units—Blackhawk Mfg. Co., Milwaukee 1, Wis. Catalog No. P-46 describes uses of all-directional Porto-Power hydraulic-jack equipment and pipe benders for maintenance, production and laboratory work. Units in 2-, 4-, 7-, 10-, 20- and 50-ton sizes are covered, along with attachments for push, pull, press, clamp, bend and lift operations.

Rheostats—Rex Rheostat Co., P. O. Box 232, Baldwin, L. I., N. Y. Catalog No. 3 covers the Rex line of rheostats and includes construction, specifications, sizes and prices.

Steels—Republic Steel Corp., 3100 East 45th St., Cleveland 4. Booklet No. ADV-445 describes the purposes, properties, composition, application and performance of the three low-alloy high-strength steels produced by Republic (Republic Aldecor, Cor-Ten and Double Strength) and developed specifically to make it possible to reduce dead weight of equipment at low cost and without sacrifice of safety, and to increase strength of equipment without adding weight.

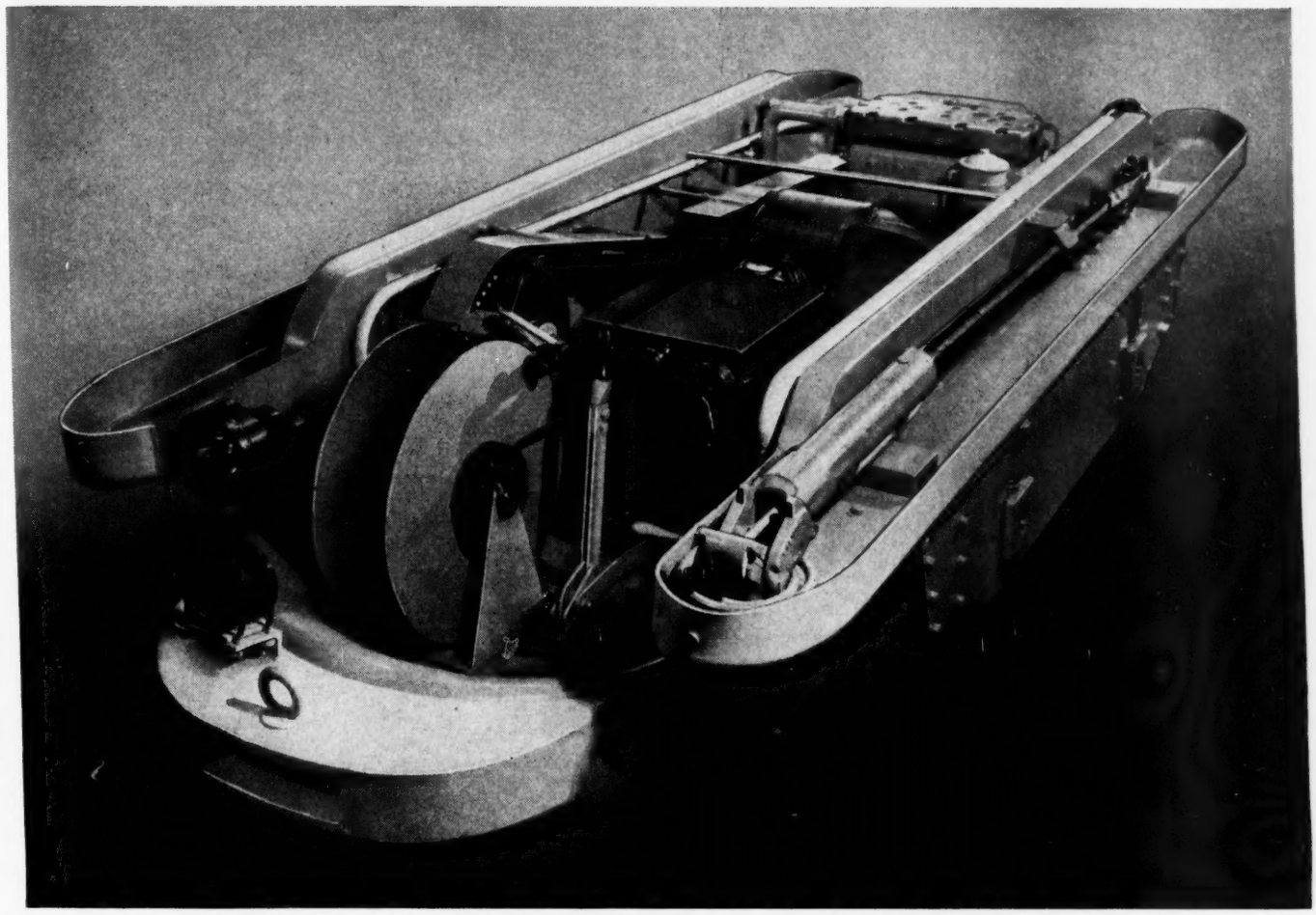
First-Aid Kits—Burroughs Wellcome & Co., Inc., 9 East 41 St., New York 17. Folders illustrate the various sizes of Tabloid First-Aid Pac-Kits and list their contents. Prices of the kits and refill items are included.

Silicones—Dow Corning Corp., Midland, Mich. Catalog lists all silicone products now available and contains many charts and graphs descriptive of the unusual properties of this family of organo-silicon-oxide polymers.

Oil and Grease Pumps—Trabon Engineering Corp., 1814 East 40 St., Cleveland 3. Bulletin No. 469 describes and illustrates the company's complete line of oil and grease pumps for manual, automatic, motor-driven and mechanically-driven operation.

Hoists—David Round & Son, Cleveland, Ohio. Bulletin No. SU-40 contains detailed specifications on 18 standard models of its Superior spur-geared hoists, ranging from ¼ to 20 tons in capacity. Superior hoists, according to the leaflet, are of the conventional high-speed spur-gear type with a mechanical efficiency of approximately 80 percent. One man, it is stated, can lift the full capacity of any hoist up to and including the 10-ton size.

Paint Use—Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22. Booklet shows how scientific use of the energy in color is currently employed in the nation's plants and factories to increase over-all efficiency and demonstrates how industrial officials, by following the principles of color dynamics, can (1) promote continuity of employment, (2) improve efficiency of operation and (3) maintain quality of production. It reveals how dynamic colors will bring about more and better work per man-hour and more man-hours per man by making the employee's working environment cheerful and safe.

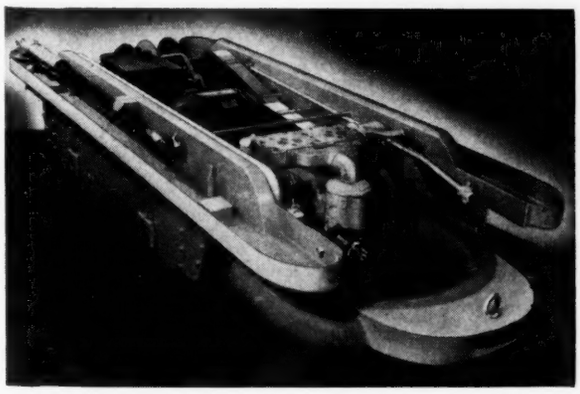


Shift a Lever . . . Presto! . . . This Cantrell "S-P" Compressor Becomes a Two-Ton Locomotive!

The Cantrell, Type S-P, Self-Propelled Air Compressor offers mine operators a new, broader service in a complete air compressor-locomotive combination. Whenever air is needed, this compressor goes . . . under its own power. Arriving at the job, a simple shift of a lever changes the power from locomotive to compressor . . . ready to deliver the dependable, rugged service that has made the Cantrell "S-P" famous in coal mines everywhere.

This compressor-locomotive can also be used for such work as ditch lining, leveling haulways, hauling repairs, shifting pumps and mining machines, chipping, riveting and blowing substations.

In addition to the Cantrell "S-P" there are four other types of compressors, for track, or trackless coal mining or stationary shop use, one of which is certain to meet your requirements. Cantrell compressors are also available for use with your own motors or air receivers. Why not write today and discover how you can take advantage of the large savings offered by Cantrell Compressors.



Shown above is a detailed view of the Cantrell, Type S-P Compressor with safety top removed. Left: Opposite end view of compressor.

Cantrell COMPRESSORS

IMPERIAL-CANTRELL MFG. CO., JELLICO, TENNESSEE

PACKAGED DUST CONTROL

THIS IS IT! - - - -

A solidified, concentrated "wetting" compound that dissolves, automatically, at the proper rate, in the water line itself.

AS EASY TO LOAD AS A SHOTGUN

COMPOUND M CARTRIDGE

WEIGHS LESS THAN FOUR POUNDS BUT WILL TREAT ABOUT 1,000 GALLONS OF WATER

This is the same effective, economical Compound M that (as a concentrated liquid) has proven its value for controlling dust on hundreds of mining installations, in a new form—the cartridge. New advantages are:

- **WATER PRESSURE DOES THE SPRAYING**
- **AUTOMATIC APPLICATION**
- **NO PUMPS OR MOTORS REQUIRED**
- **SIMPLE TO INSTALL**
- **MINIMUM MAINTENANCE**

EASY TO CARRY INTO THE MINE

★ NO DRUMS TO HANDLE ★

COMPOUND M CARTRIDGES ARE PACKED IN CARTONS—LIKE DYNAMITE

- **ONE CARTRIDGE LASTS A FULL SHIFT**
- **INDIVIDUAL CONTROL ON EACH MACHINE**

CUTTING · LOADING · ROTARY DUMP · TIPPLE

This new "cartridge form" of concentrated wetting compound was developed by The Johnson-March Research Laboratory, to meet the specific requirements of the mining industry. Like regular Compound M, it meets all requirements of Mine Safety Code.

This easy-to-handle "wetting" cartridge, with its sturdy, inexpensive automatic dispenser, permits adequate control at every point where dust originates.

Ask for full details — Our Engineers are at your service

The JOHNSON-MARCH CORPORATION

52 VANDERBILT AVENUE • NEW YORK, 17, N. Y.

Manufacturers of Chemical Products for Mining and Industry

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THE NEW LIMA type 604

EVERYTHING THAT COULD BE ASKED FOR IN A 1½ CUBIC YARD SHOVEL OR 30 TON CRANE...

"PRECISION" AIR CONTROL
ANTI-FRICTION BEARINGS
INDEPENDENT CHAIN CROWD
ONE-PIECE WELDED FRAME
FOLDING GANTRY FRAME
WELDED STEEL SHOVEL BOOM
TUBULAR DIPPER HANDLE
ROLLER CHAIN POWER TAKE-OFF
CONVERTIBLE FRONT ENDS
INDEPENDENT BOOM HOIST
HOOK ROLLERS
CENTRAL LUBRICATION
MODERN STREAMLINED CAB

The LIMA Type 604 is a brand-new convertible shovel, crane and dragline that brings to the user everything that could be asked for in a 1½ cubic yard shovel or a crane of 30 tons capacity. Tested under actual job conditions—this great new LIMA has proved that it has the same superior quality, unrivalled ruggedness and great power that characterize all LIMA shovels, cranes and draglines. Its modern, up-to-the-minute design embodies numerous advantages and refinements that contribute to lower operating costs and peak performance throughout a long and profitable life. Yes, you will agree that the Type 604 was worth waiting for. Write today for a copy of bulletin 64.

LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division LIMA, OHIO, U. S. A.

OFFICES IN PRINCIPAL CITIES

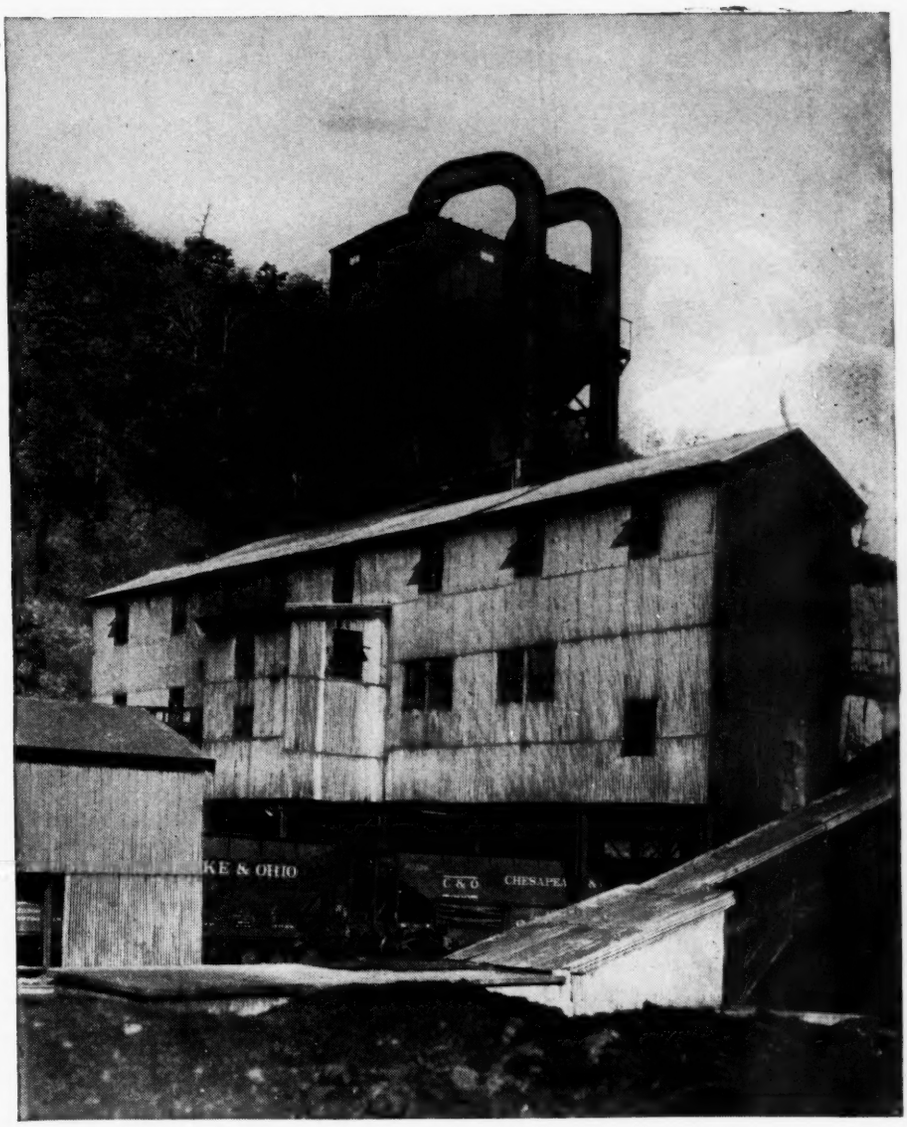
LIMA SHOVELS CRANES DRAGLINES

Capacities
Shovels ¾ Yd. to 5½ Yds.
Cranes 13 Tons to 100 Tons
Draglines Variable

LIMA

THE LIMA DIAMOND
FOR 75 YEARS AN EMBLEM OF QUALITY WORKMANSHIP

Pangborn Makes Coal Dust Behave



Desire for increased safety and improved working conditions—lower-cost equipment maintenance—efficient coal dust disposal and reclamation—elimination of nuisances—is responsible for the large number of Pangborn dust control installations in coal preparation plants.

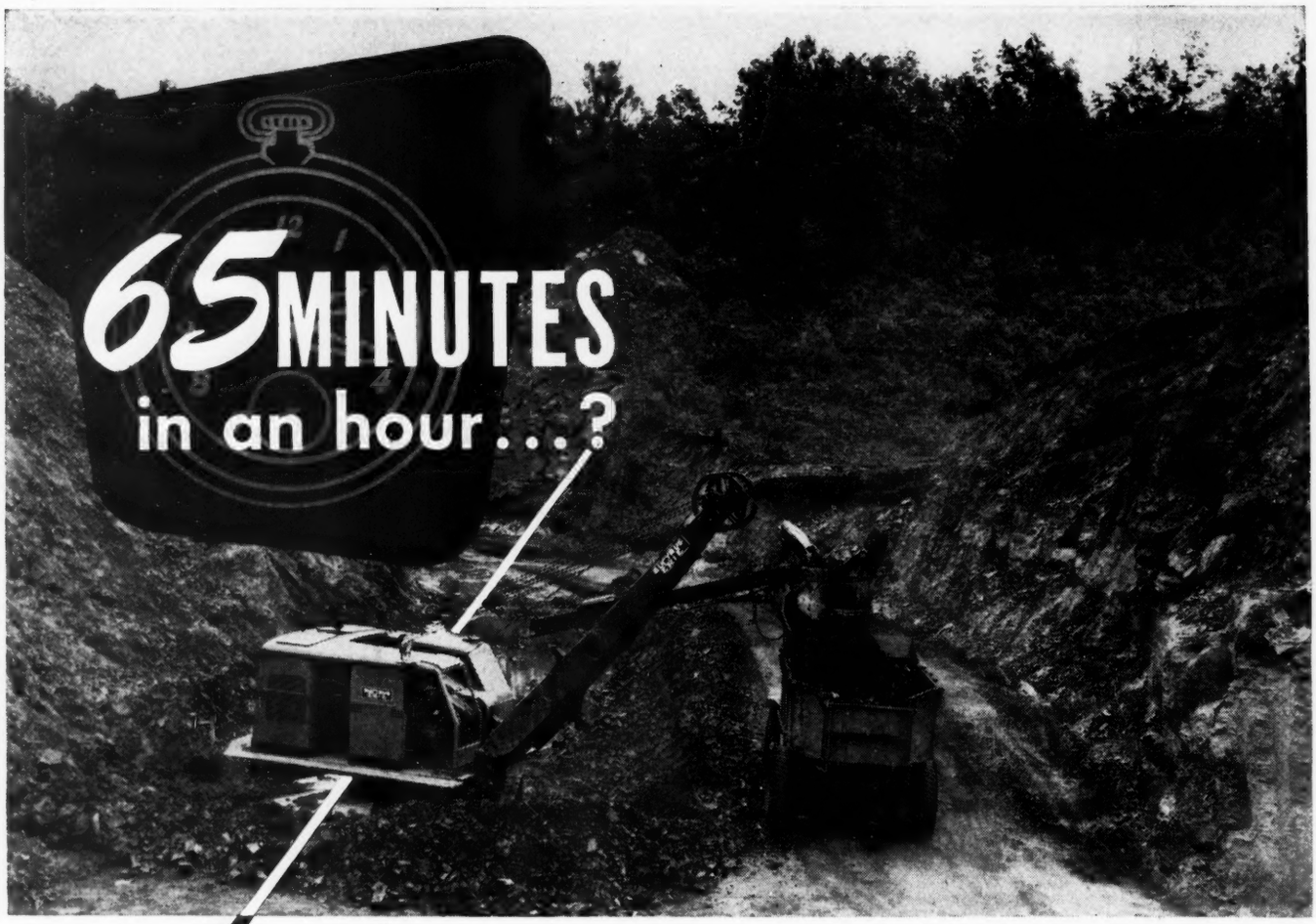
For many years a "Pangborn" has been the recognized method of effectively collecting the fine coal dust that is produced in the operation of tipples, dry cleaning, de-dusting and other coal preparation facilities.

With this background of successful experience in the coal industry, Pangborn engineers offer you an effective and economical solution to your dust problems.

Write for free Bulletin 909A, "The Control of Industrial Dust". Address Pangborn, *world's largest manufacturer of dust control and blast cleaning equipment,* at 288 Pangborn Boulevard, Hagerstown, Maryland.

Pangborn
DUST CONTROL
PANGBORN CORPORATION, HAGERSTOWN, MARYLAND

TURNS DUST LOSSES INTO PROFITS



Obviously, ...no

ADJUSTMENTS, because they are all easy to make and last once you make them;

MAINTENANCE, because machinery arrangement is simple and accessible, and because balanced minimum-stress performance means few repairs;

LUBRICATION, because fittings are easy to reach, difficult to overlook;

MOVES, because the simple, efficient caterpillar mounting and the easy steering combine to permit fast maneuvering on the job;

But by taking advantage of the extra working time you get every hour of every shift with Bucyrus-Erie ⅜- to 2½-yard excavators, and measuring time in terms of output, you get a similar effect. With Bucyrus-Eries you "expand" each hour by saving time on:

OPERATING, because the controls give "full feel," are easily operated, and are all conveniently grouped so that the operator does not need to leave his position.

That means more time to put to work really outstanding digging ability — the result of design that combines the best performance features developed in Bucyrus-Erie's long experience in manufacturing excavators. Quickly convertible in the field, Bucyrus-Eries are equally effective as shovels, draglines, clamshells, or cranes.

you make the most of EVERY HOUR with a BUCYRUS-ERIE

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

55646

Telling the Public the Facts About Our Industry

B. C. I. Speakers' Bureau and Motion Picture Program Spread Correct Information

● Organized to bring authoritative representatives of our industry face to face with influential audiences throughout the country, the Speakers' Bureau is one of the Bituminous Coal Institute's most rapidly expanding activities. *In its first half-year the Bureau filled 257 requests for speakers*—and the demand is constantly growing. Currently, invitations to send speakers are being received at a rate of more than three a day.

Already, more than 150 volunteer speakers are available to tell the facts about coal to business and civic clubs, lodges, schools, and similar groups. Most of these speakers are coal company executives. They give their time and talent to fill speaking dates in their own or neighboring communities. The Institute supplies them with a selection of speech material that can be used as it is written or as a help in organizing individual talks.

Special Movie Audiences

In addition to the growing audiences reached by these coal industry speakers, hundreds of other groups are hearing and *seeing* facts about the industry through circulation of "The Magic of Coal." In eighteen interest-packed minutes, this sound motion picture gives a dramatic view of many aspects of coal, from modern mining methods to the varied end uses of coal and its by-products. Circulated by two national film libraries, this Institute-sponsored picture has been in brisk demand and is being seen by increasing thousands.

Both the Speakers' Bureau and the Institute's motion picture activity are organized to serve the industry. You are urged to take advantage of them in your community or for those you serve. Ask the Bituminous Coal Institute for details as to how you can use them to your own and our industry's advantage.

These activities are part of the Institute's broad public relations program. It is a program with three years of solid accomplishment behind it. Now, with an even more helpful future, Bituminous Coal Institute deserves the active support of every forward-looking Bituminous Coal operator.

BITUMINOUS COAL INSTITUTE

Washington, D. C., Affiliate of National Coal Association

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA

Duralite Goggles

A-O improved No. 301A Duralite Goggles provide comfortable eye protection for workers exposed to the hazard of flying particles coming from any direction.

Individual eyecups are anatomically molded to fit the contour of the right and left eye. Smooth, round edges of the cups fit snugly against the face, protect the eyes from objects striking from the sides, top or bottom. Serrations in the edge of cups, ventilated retaining rings, plus extra side perforations, provide greatly increased ventilation, produce a natural draft behind the lenses reducing the possibility of fogging. Available with 6 Curve Super Armorplate lenses, clear or Calobar.

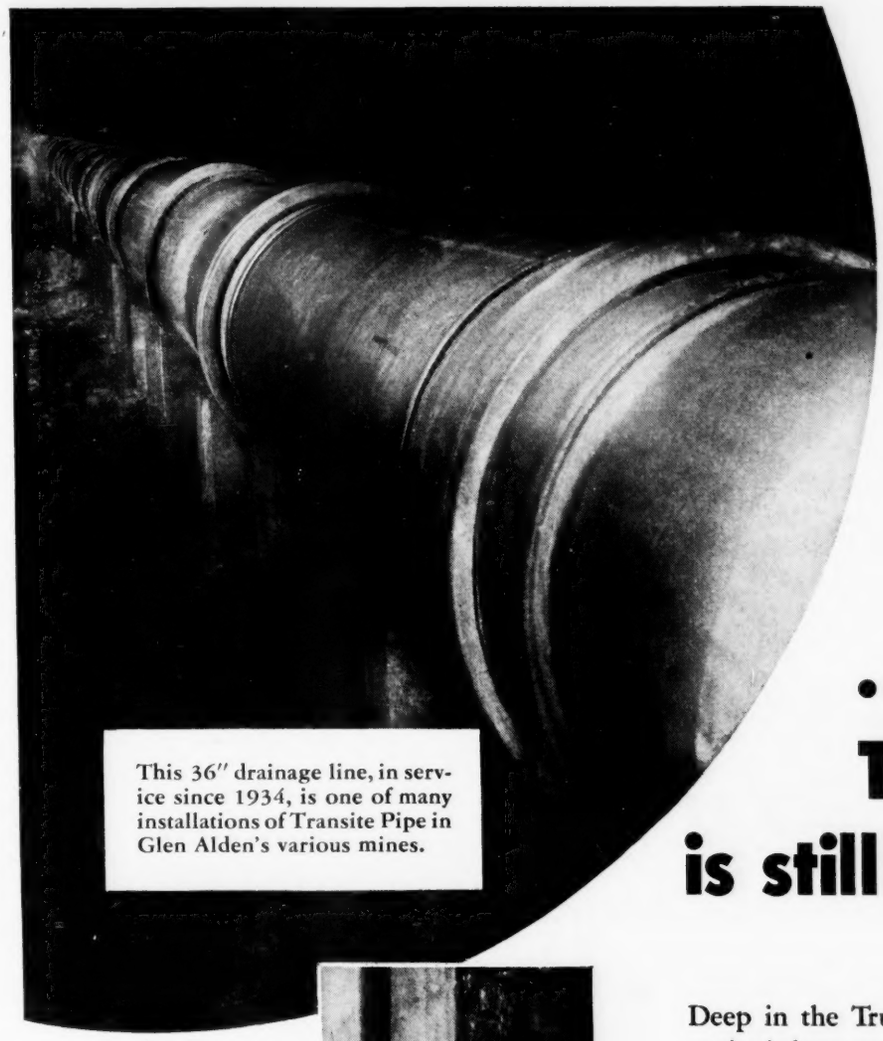
GIVE WORKERS MAXIMUM PROTECTION & COMFORT

A Correct Type of Goggles for Every Industrial Need

Send to American Optical Company, Box C, Southbridge, Mass., for a copy of this booklet. It describes in detail the complete line of A-O Cup Goggles for use by chemical workers, chippers, welders, foundry men and workers exposed to general dust conditions.

American Optical COMPANY *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES



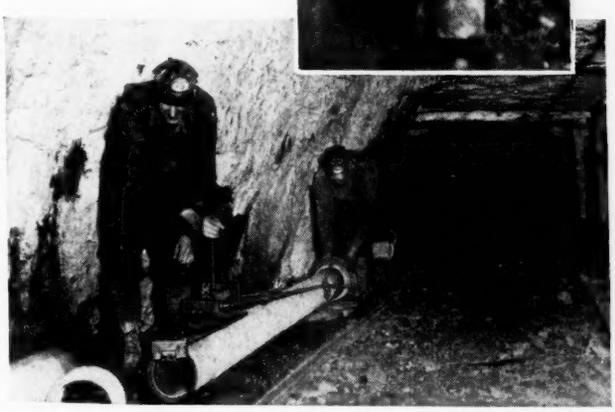
This 36" drainage line, in service since 1934, is one of many installations of Transite Pipe in Glen Alden's various mines.

12 Years Carrying Acid Waters

...and this TRANSITE PIPE is still going strong!

Right: Flexible Simplex Couplings permit laying of Transite Pipe on curves without special fittings.

Below: Two men can readily assemble Transite Pipe, even in restricted mine passages.



Deep in the Truesdale, Pennsylvania, colliery of the nation's largest anthracite producer . . . the Glen Alden Coal Company . . . this installation of Transite Pipe has been draining acid mine waters for more than 12 years! Still in remarkably good condition, it is further convincing proof that Transite meets the "acid test" of mine drainage service.

For Glen Alden's experience with Transite, in mine drainage service, is not unusual. Producers in many fields now figure the life of their drainage pipe in years instead of months—thanks to the exceptional corrosion-resistance of this asbestos-cement pipe.

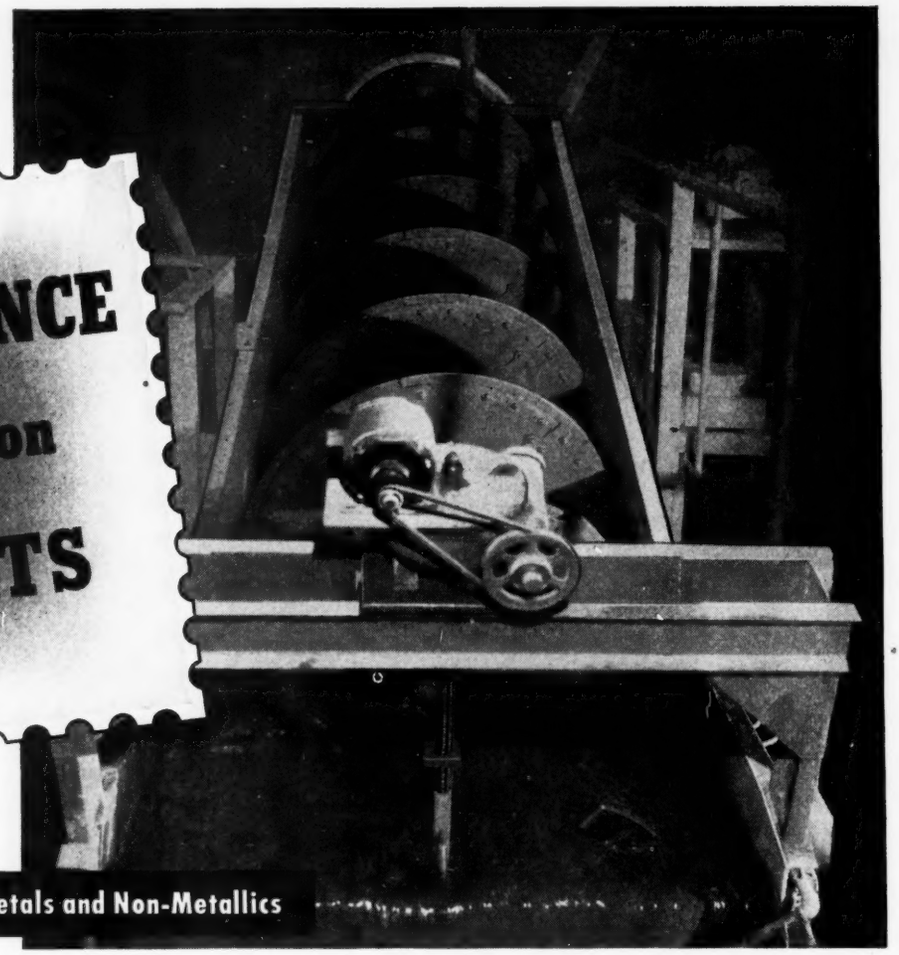
In other types of mine service, too, Transite has proved itself a money-saving investment. For fresh water supply lines, its unusually high delivery capacity and freedom from troublesome tuberculation (internal corrosion) contribute to real economies in pumping costs. Its light weight and easily assembled Simplex Couplings assure additional savings in installation wherever it is used.

For further details, address Johns-Manville, Box 290, New York 16, New York.

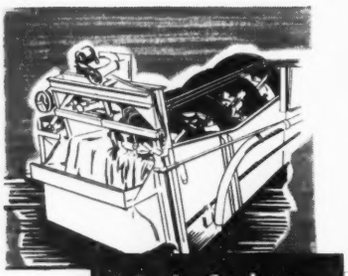
JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE PIPE FOR COAL MINE SERVICE

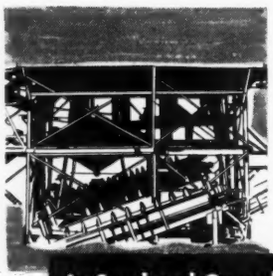
ACCEPTANCE is based on RESULTS



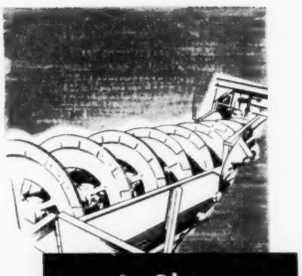
. . . in Base Metals and Non-Metallics



. . . in Coal



in Sand and Gravel



in Glass

in Chemical

WEMCO Screw Classifiers Mean Increased Tonnage at Lower Costs . . .

. . . to the operator. This is the reason for their nation-wide acceptance. Reports from each field show higher tonnage; efficient separation; safe, economical maintenance with minimum repair costs.

Each WEMCO Screw Classifier is tailored to your exact requirements: **Simplex or duplex units**—*single or double pitch spirals*—**adjustable spiral speed**—*suitable length drainage decks*—**manual or electrical screw-lifting devices**—*standard or corrosion-resistant materials.* All these developments by WEMCO are your assurance of classifiers that will meet your requirements regardless of the job you give them.

THAT'S WHY INDUSTRY BUYS WEMCO

WEMCO

WESTERN MACHINERY COMPANY

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LOS ANGELES • SACRAMENTO • SPOKANE • SALT LAKE CITY • PHOENIX • DENVER • NEW YORK • WASHINGTON, D. C.

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HMS EQUIPMENT • ORE FEEDERS
HMS "MOBIL-MILL"

WM-8

Solving AIR COMPRESSOR TROUBLES

Lubrication Engineer's Report:

"A mining company* in the Joplin area was having trouble with the unloading valve on an Angle Compound Air Compressor. They were also troubled with discharge valve breakage of the high pressure cylinder.

Case No. 1:

"The previous oil was replaced with Cities Service North Star Oil No. 5 and not a single instance of gumming or sticking or trouble of any kind with the unloading valve or discharge valve has been reported in over two years."

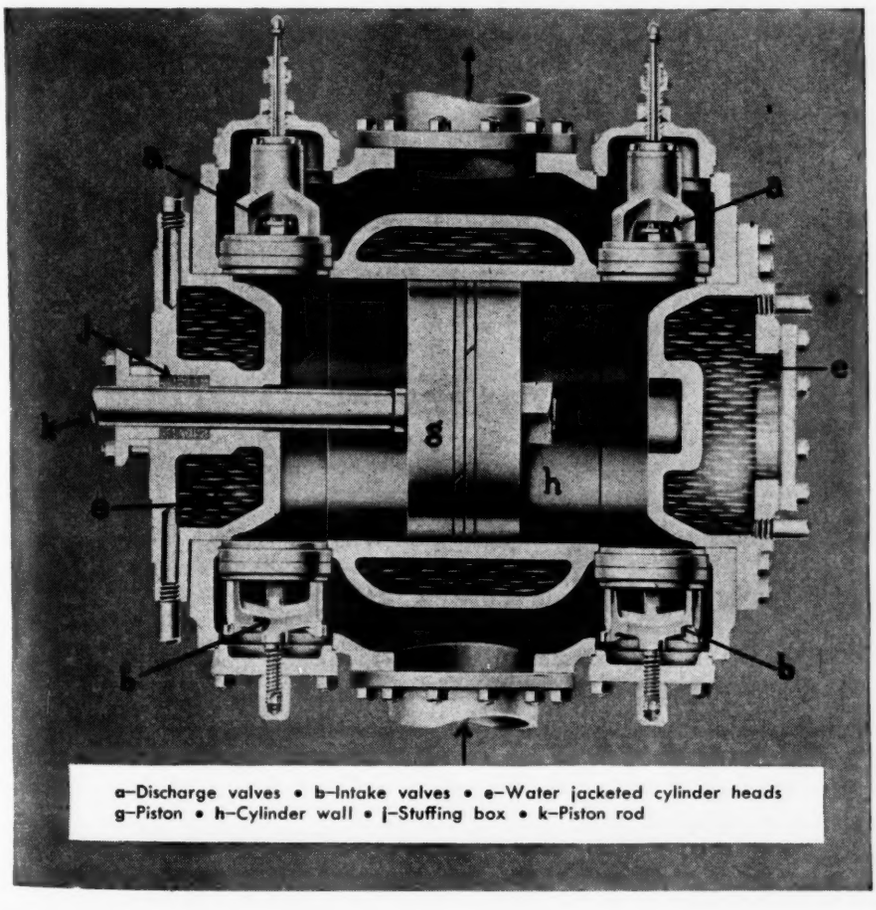
Case No. 2:

"A utility plant* in Springfield, Mo., uses compressed air from a single stage belt-driven air compressor in connection with overhauling jobs of the boilers in their plant. They are all of the water tube type and are overhauled at regular intervals. During these overhauls they need a constant supply of air. The unloading valve of this compressor would gum up to the extent that they would have to clean it about every other day when using a competitor's oil. I sent them a drum of Cities Service North Star Oil No. 5 about a year ago, and checked with their Chief Engineer last month. He tells me they haven't had to clean the unloading valve since putting in the North Star Oil."

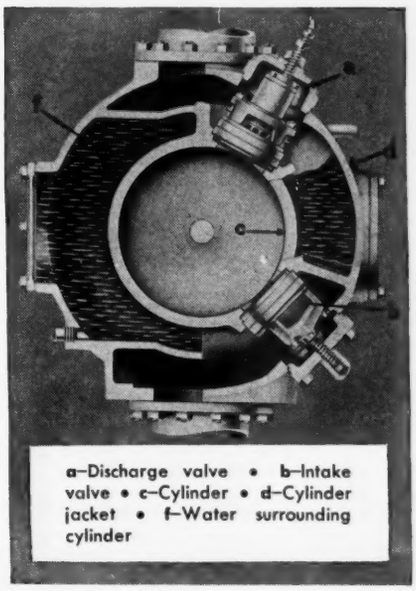
Case No. 3:

"We have lubricated a 1000 cubic foot two-stage air compressor in the Mid-Continent area for over three years. The customer* says that in using Cities Service North Star Oil No. 5 in this compressor he hasn't had any valve breakage and that carbon deposit on valves and seats has been down to practically nothing."

Names on request.



a–Discharge valves • b–Intake valves • e–Water jacketed cylinder heads
g–Piston • h–Cylinder wall • j–Stuffing box • k–Piston rod



a–Discharge valve • b–Intake valve • c–Cylinder • d–Cylinder jacket • f–Water surrounding cylinder

Solving compressor operating problems has been Cities Service's special forte for years. A phone call or card to the Cities Service office nearest you will bring this engineering experience to *your* plant. There is no obligation. For useful information that every air compressor owner and operator should know, write for our free booklet, "Air Compressor Lubrication." Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y., Room 19.

Free Booklet:

Cities Service means Great Service

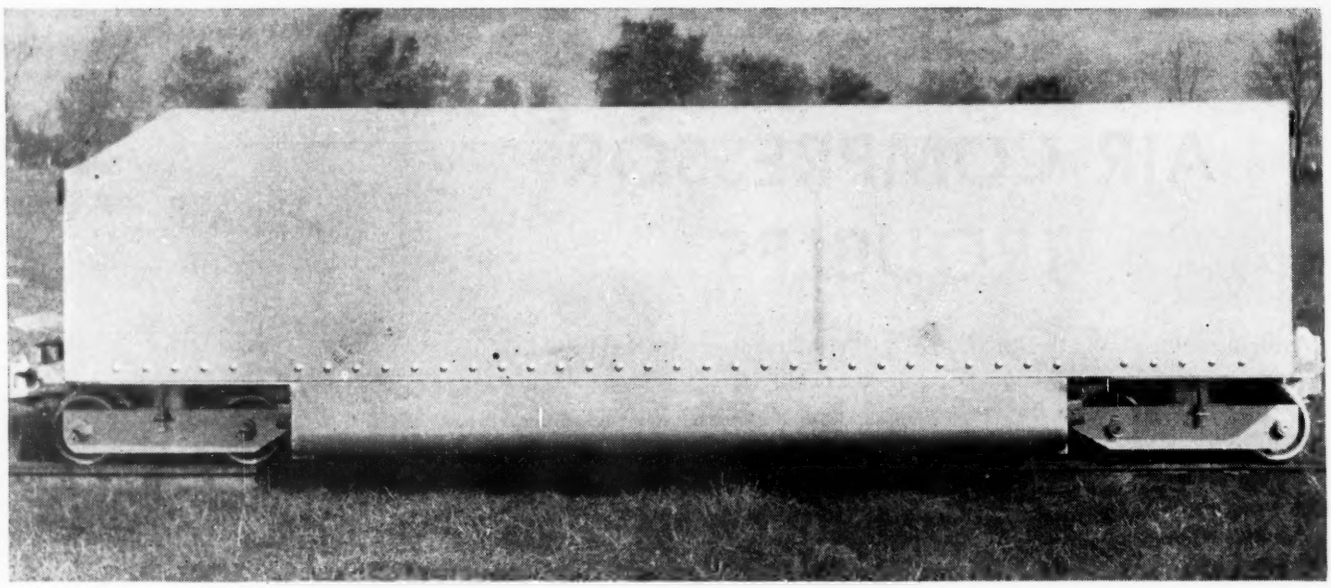
CITIES SERVICE

Cities Service Oil Co.
NEW YORK · CHICAGO

Arkansas Fuel Oil Co.
SHREVEPORT, LA.

DIFFERENTIAL MINE CARS

LARGE CAPACITY—8 WHEELS—AXLESS TRUCKS



Thousands Of Differential 8 Wheel Mine Cars, Operating Under Many Different Conditions, Have Abundantly Proved That Differential Cars:—

DO LOWER COSTS
DO INCREASE PRODUCTION
DO REDUCE ACCIDENTS
DO POSSESS OTHER IMPORTANT ADVANTAGES WHICH ARE OUTLINED IN BULLETIN D-53. SEND FOR IT.

DIFFERENTIAL MAN-TRIP CARS

★ MAKE MAN TRIPS SAFE ★ SPEED UP MAN TRIPS
★ MAKE MAN TRIPS COMFORTABLE

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO, U. S. A.

Builders of Haulage Equipment Since 1915

AIR DUMP CARS · MINE CARS · MINE LOCOMOTIVES · ROCK LARRIES · DUMPING DEVICES
BURDEN-BEARING LOCOMOTIVES · STOCKPILING CARS · COMPLETE HAULAGE SYSTEMS

YOUR DOLLAR BUYS LONGER SERVICE IN

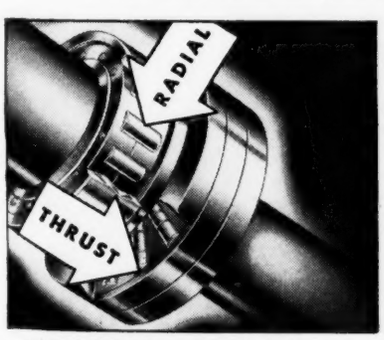
ROLLWAY

RIGHT-ANGLE-LOADED BEARINGS

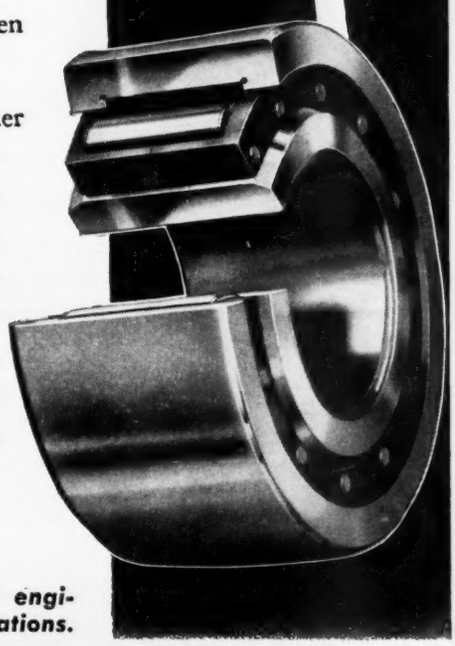
ROLLWAY's Right-Angle-Loaded Bearings have longer life because Rollway uses the principle of *right angle loading*. This splits every load into its component parts of pure radial and pure thrust. Each component load is carried on a separate bearing assembly at a *right angle to the rollers.*

For this reason, Rollway Bearings can use efficiently solid cylindrical rollers of greater mass and cross section area in a given space. The unit load per roller is lower and the load capacity for a given dimensional limit is higher.

As the diagram shows, no oblique loads or resultants, no other compound loads can pile up to increase the magnitude of the simple radial or thrust component. Resistance to shock and vibration is increased. Pinch-out of rollers is eliminated—with less rubbing friction and less wear-back of roller ends. The net gain is clearly apparent in longer bearing life . . . less service attention . . . and lower maintenance cost.



All radial loads carried at right angles to the roller axis. All thrust loads carried at right angles to the roller axis.



Free Service ***Send us your plans today for engineering analysis and recommendations.***

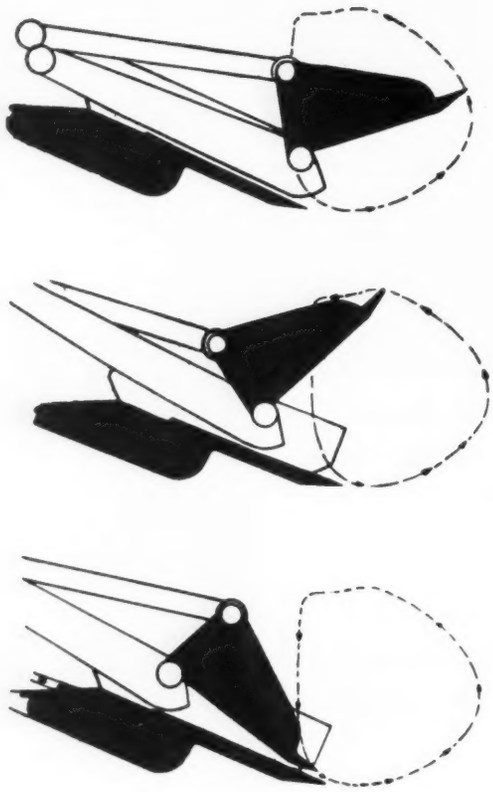
ROLLWAY BEARINGS

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

SALES OFFICES: Philadelphia • Boston • Pittsburgh • Cleveland • Detroit • Chicago • Minneapolis • Houston • Los Angeles

SAFE LOADING

—Another reason why you need the WHALEY "AUTOMAT"



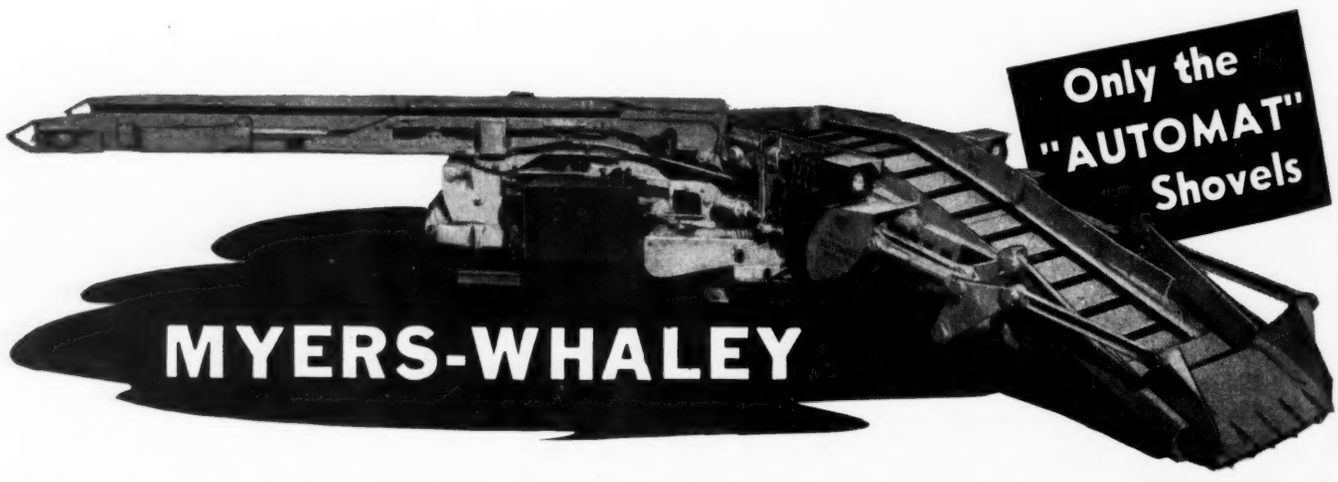
Note in illustrations above how the natural shoveling action of the "Automat" is an under, up and back movement for depositing coal on front conveyor.

Safe loading is a factor wise mine operators just can't afford to overlook in buying a loader. When you are working in narrow entries and closely timbered places, sudden side kicking of a rear conveyor can mean disaster . . . serious injury to men . . . knocked out timbers and falls.

Safe loading is as dependable as maximum production, even under the most adverse working conditions, with the Whaley "Automat". You see, the loading head of the Whaley "Automat" operates in a vertical lift shoveling action . . . all power is directed in a vertical plane, making side kicking impossible. Therefore, the danger of crushing men or knocking out timbers is eliminated.

If you're buying a loader, buy a safe loader, along with maximum production at minimum power costs, too. You'll get all of these advantages in a Whaley "Automat". And remember, the "Automat" will load—in its stride—any lump of coal that will pass through your tipple, or any lump of rock your cars, aerial tram or larries, can take. Myers-Whaley Co., 139 Proctor, Knoxville 6, Tennessee.

Wm. Neill & Son, Ltd., St. Helen's Junction, Lancashire, England, are licensed for Manufacture and Sale in Great Britain and Europe.



Mechanical Loaders Exclusively for Over 39 Years

COAL AGE READERS PLEASE NOTE*

A very practical and helpful editorial section will appear in April COAL AGE—one that will present an extremely important viewpoint on mechanized methods in the coal industry. This issue will be mailed about four weeks ahead of the Coal Exposition to be held at Cleveland in May.

YOUR FIRST LOOK AT NEW EQUIPMENT IN SIX YEARS

You who attend that Exposition will be surveying the equipment needs of your own properties and weighing the products you see against those needs. You will be very much interested in seeing what is new and improved in machinery, equipment and supplies because of the benefits you might gain from them.

MECHANICAL EQUIPMENT NOT ENOUGH ALONE

COAL AGE editors feel that the maximum efficiency can be obtained, even from the very *best* equipment, only through planned coordination of machines, men and management. To present this view in detail, together with suggestions for successful practices, is the purpose of this special section.

Timed to suggest this very practical viewpoint, to which all manufacturers of equipment will subscribe, just before the exhibit in Cleveland, the April issue of COAL AGE will be

THE PRE-CONVENTION NUMBER

We urge extra careful reading of this section, because we believe it will help you to achieve the *maximum* results from the equipment you buy, as well as that already in service.

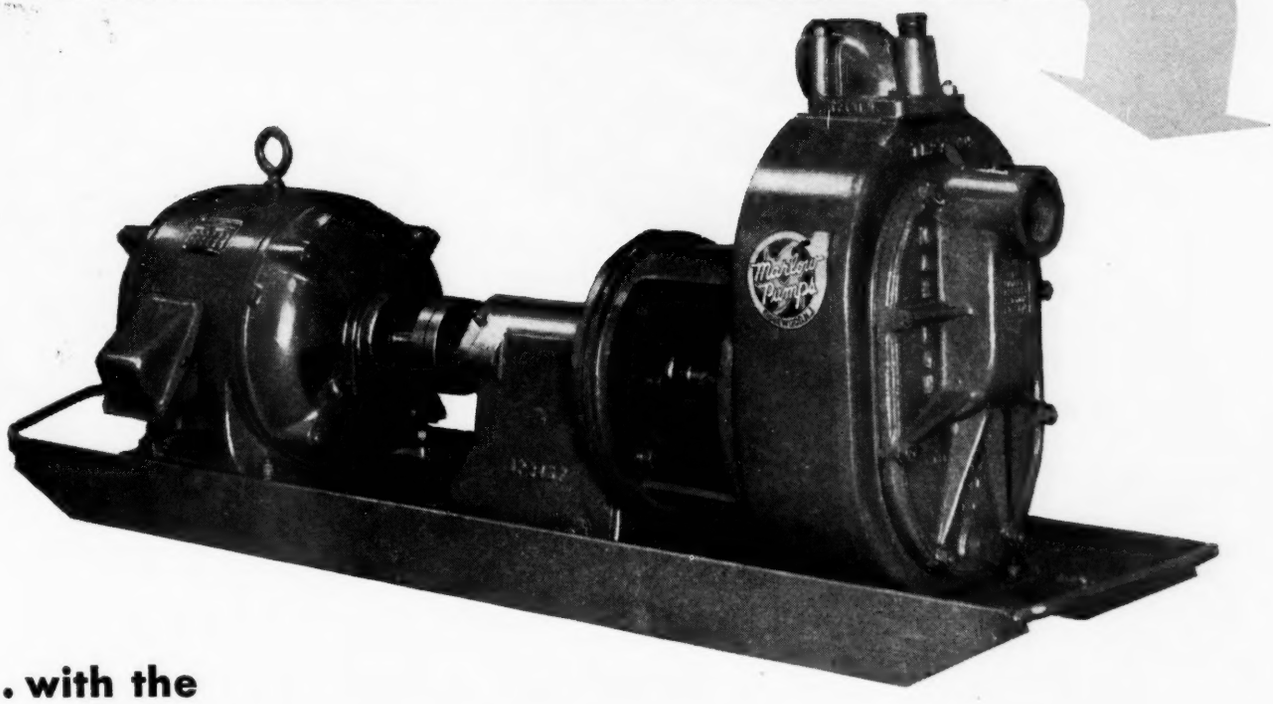
Coal Age

ABC • ABP

A McGraw-Hill Publication

330 West 42nd Street, New York 18, N.Y.

KEEP
DEWATERING COSTS DOWN

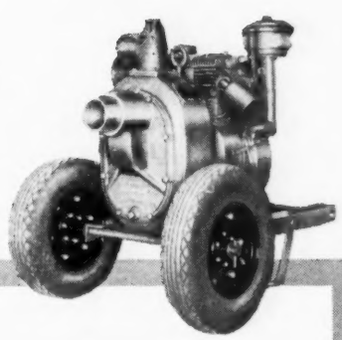


. . . with the
MARLOW Mine Gathering Pump

Self-priming . . . efficient . . . trouble-free . . . long lasting. These advantages in the fullest degree are the contributions of the Marlow Mine Gathering pump to lowest cost mine seepage control.

The exclusive Marlow "diffuser method" of self-priming and pumping is far-advanced . . . assures fast, certain, fully automatic operation. Simple, free-flow design is efficient, trouble-free, thrifty. No parts to get out of order. Nothing to manipulate or adjust.

Constructed extra strong for longer life. You can rely on Marlow pumps not only to help you get drainage costs down most . . . but to help *keep* them down. Made in 2-inch and 3-inch sizes, mounted on sled-type base or rubber tired tricycle. Bulletin EM46 gives complete details.

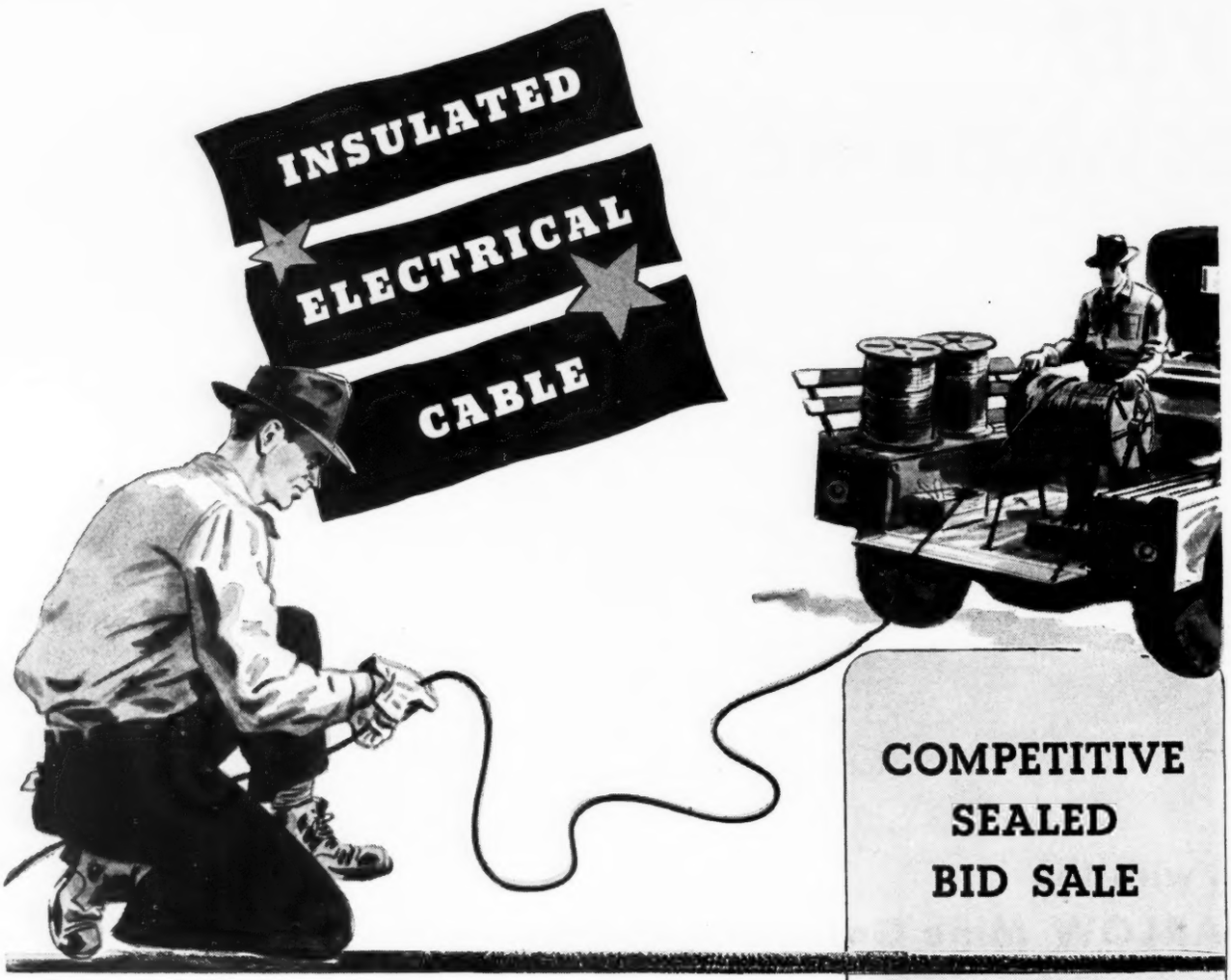


OTHER MARLOW CENTRIFUGALS HELP CUT STRIP MINE DRAINAGE COSTS.

These too, self-prime and pump entirely automatically, even when placed as high as 25-feet above water. Direct action . . . no wasted motion. Once started on job they require no more attention. The same simple, efficient design prevents clogging or jamming. Dependable in performance and ruggedly made to last longer. Sizes 1½ to 10 inches; 50 to 4000 GPM. Fully described in Bulletin G46.

Write for booklets and name of nearest distributor. Marlow Pumps, 548 Greenwood Avenue, Ridgewood, New Jersey

MARLOW PUMPS ***MANUFACTURERS OF QUALITY PUMPS SINCE 1924***



COMPETITIVE SEALED BID SALE

Miles and miles of this rugged, *unused* wire and cable offer money-making opportunities to alert commercial buyers and exporters . . . and these buyers "name their own prices" in this easy-to-buy, sealed bid sale. Large quantities of this valuable material, conveniently packed in coils or on reels, are held by New Orleans, New York, Los Angeles, San Francisco and other War Assets Administration Regional Offices shown below. Your inspection of this material is invited. Address your inquiries directly to the Regional Offices listed below.

U. S. NAVY and MARITIME WIRE and CABLE offered in this sale feature:

Rubber and synthetic insulations	1,630 to 2,000,000 circular mils
Voltage rating of 300 to 600	One to forty-four conductors
Basket weave armors	Identifying braids
Varnish cambric	Rubber jackets
Asbestos braids	Cotton braids
Plastic sheaths	Lead sheaths

☆ ☆ ☆

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WAR ASSETS ADMINISTRATION

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Los Angeles • Louisville • Minneapolis • New Orleans • New York • Portland
Richmond • St. Louis • Salt Lake City • San Francisco • Seattle • Spokane

1025

HOW TO BUY:

Valuable equipment and materials, such as this U. S. Navy and Maritime Wire and Cable, are constantly being offered by all of the Regional Offices listed below. Sales are conducted on both competitive sealed bid and fixed price basis. Dates of sales—and conditions governing all transactions—will be sent to you upon request. Request should be made directly to Regional Offices. To keep completely informed on commodities inventories, minimum and maximum purchases, dates of sales, etc., of each Regional Office, requests should be made to be placed on the mailing lists of each and every Regional Office which could serve your needs.

☆ ☆ ☆

EXPORTERS:

Your business is solicited. Exporters are considered as wholesalers in the purchase of surplus property. Any questions on export control should be referred to Office of International Trade, Department of Commerce, Washington 25, D. C.

SIMPLEX JACKS

through THICK ---------- or THIN

FOR THICK SEAMS

The Simplex No. 86A (5-tons), is 20" in height and has a 13" lift. It is the ideal jack for moving and adjusting cutting machines, conveyors and loaders, etc., wherever headroom permits the use of a jack of this size. It is speedy, rugged, and includes such vital safety features as Simplex double lever sockets, extra strong springs and links, short fulcrum centers, etc.

FOR MEDIUM SEAMS

The Simplex No. 85A (5-tons) is 17" in height and has a 10" lift. It provides all the efficiency and safety features of the Simplex No. 86A for locations where more limited height and lift are required. It combines maximum strength, minimum weight, wide concave rack bar toe lifts, large trunnion bearings, strong pawls and reinforced inner-ribbed housings.

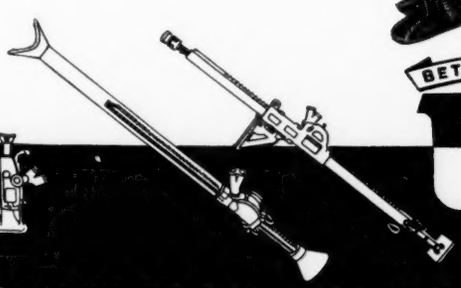
FOR THIN SEAMS

The Simplex No. 84A (5-tons) is 14" in height, has a 7" lift and weighs only 28 lbs. It is designed and constructed for easy handling and use in cramped quarters. This efficiency has been achieved without sacrifice of any of the safety features that have made Simplex Jacks outstandingly popular wherever coal is mined.

Every one of your machines should carry a Simplex Jack of proper size for most efficient operation on the seam being worked. Send for Bulletin—Mines 46.

← **No. 185** (5-tons) Height 17", lift 10". Lifts at right angle to operator on auxiliary shoe.

(10-tons) Height 17", **No. 1017** → lift 9½". For working medium seams. Answers the demand for a light weight, heavy capacity jack for modern heavy mining equipment.

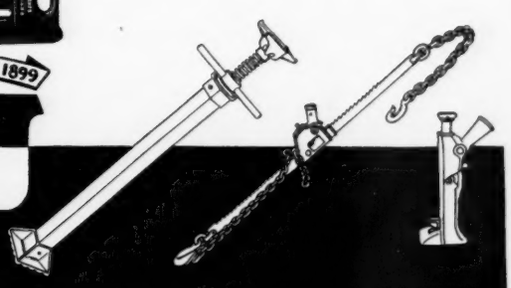


BETTER. SAFER. JACKS SINCE 1899

Simplex

LEVER - SCREW - HYDRAULIC

Jacks



TEMPLETON, KENLY & CO. • 1040 South Central Avenue, CHICAGO 44, ILLINOIS

INDUSTRY

MAINTENANCE SHOPS

DISTRIBUTORS

DEALERS

Depend on WAA for the

ARC WELDERS

You need

Through WAA you have a rare chance to get needed welders at minimum cost. All machines are of such well-known makes as Lincoln, Hobart, Westinghouse —all will give years of hard service.

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TYPES AVAILABLE:

DC welding machines; electric motor driven generator; single operator type; 200, 300, 400 and 600 ampere capacity.

AC welding machines; single operator, transformer type; 300, 400 and 500 ampere capacity.

AC welding transformers for use in automatic arc welding process.

See our display booth at Western Metal Exposition and Congress Show at Oakland, California, March 22 to 27, 1947.

INVENTORIES ARE LOCATED IN THESE CITIES:

Atlanta	Little Rock
Boston	New Orleans
Birmingham	Houston
Cleveland	Portland, Oregon
Detroit	Philadelphia
Fort Worth	Richmond
Jacksonville	San Antonio
Louisville	Seattle
Los Angeles	San Francisco

Write to the above Regional Offices to have your name placed on the mailing lists for equipment of this type.

AT AMAZING LOW PRICES

Millions of pounds of welding electrodes, welding rods and welding wire of carbon steel, stainless steel and non-ferrous metals.

All arc welders are sold under existing priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the materials offered herein.

EXPORTERS: Your business is solicited. If sales are conducted at various levels you will be considered as a wholesaler. Any inquiries concerning export control should be referred to Office of International Trade, Department of Commerce, Washington, D. C.

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WAR ASSETS ADMINISTRATION

GOVERNMENT WAA SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis Nashville • New Orleans • New York • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa

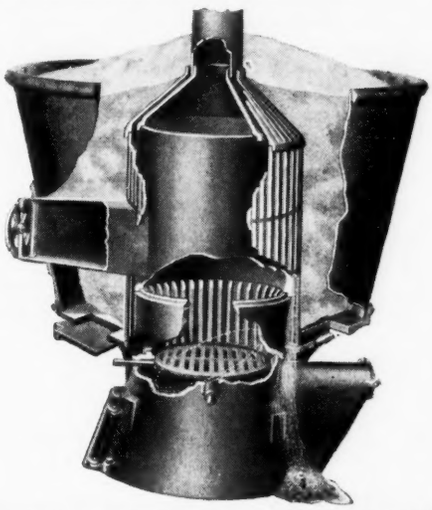
1026

YOU SAVE 2 WAYS

with the Viloco Sand Dryer

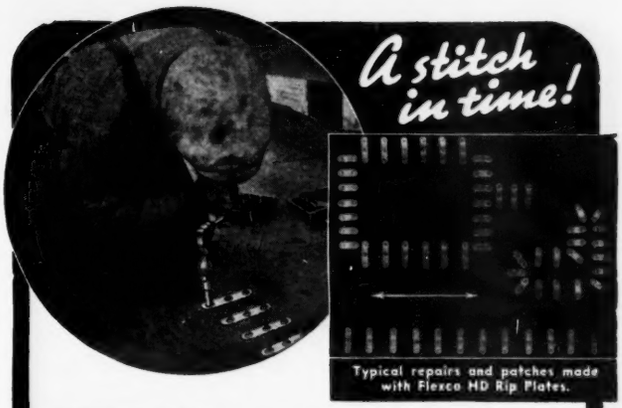
• SAVE ON FUEL COSTS • SAVE ON MAINTENANCE COSTS

Here's why—operation is automatic, sand flows freely through grating as it dries, easily accessible cleaning slides, fire grate readily removable through ash door. Parts next to fire of Chrome Nickel Heat Resisting Iron. Made in two sizes: 3 cubic yards and 1 cubic yard capacity. *For further details write for Circular C-3.*



VILOCO RAILWAY EQUIPMENT CO.

332 SOUTH MICHIGAN AVE., CHICAGO 4, ILLINOIS



Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.

4638 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS

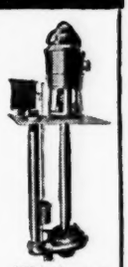
REG U.S. PAT. OFFICE

Sold by supply houses everywhere

BUILT to MEET RESPONSIBILITY

PUMPS "by Aurora"

The able performance of our pumps, with high efficiency and lasting dependability, fulfills the fundamental purpose of our business. Put a PUMP "by Aurora" on that next liquids handling job. You'll LIKE IT, TOO!

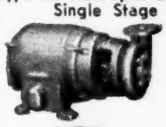


NSA Aurora Centrifugal Sump Pump

Aurora Deep Well Turbines for all conditions—4" to 24"

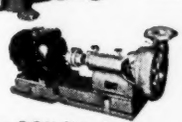
Type AD Hor. Split Case, Two Stage Centrifugal

Type OD Hor. Split-Case Double Suction Single Stage Centrifugal

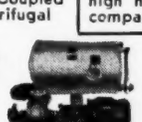


Type G M C Close-Coupled Centrifugal

Apco Turbine-Type Pumps The simplest of all pumps. Ideal for small capacity, high head duties. Silent, compact and lasting.



Type GGU Side Suction Single Stage Centrifugal



APCO Horizontal Condensation Return Unit

APCO Single Stage Turbine-Type

Write for **CONDENSED CATALOG M** or See Our Catalog in SWEETS.

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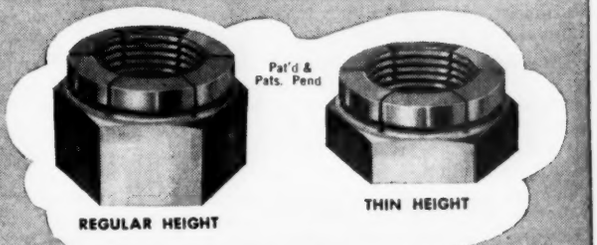
AURORA Always PUMPS

AURORA PUMP COMPANY

92 Loucks Street, AURORA, ILLINOIS

FLEXLOC



SELF-LOCKING NUTS

CAN YOU BE SURE THAT A PLAIN NUT WON'T SLYLY UNWIND ITSELF? If not, then what you need is the All-metal, One-piece "Flexloc" which is a Self-Locking Nut that won't budge, except when a wrench is used.

"Flexloc" packs maximum usefulness in minimum space because it is rugged, locked, compact—and is therefore, becoming increasingly popular and this applies alike to U.S.S. and S.A.E. thread series.

Every thread—including the locking threads—takes its share of the load.

Covers a wide range of tolerances—from low #1 to high #3. Can be used over and over again without losing much of its locking ability.

Being a "stop" nut, it stays locking in any position on a threaded member.

"Flexloc" Thin Nuts are especially popular, because their tensile is so high.

Sizes from #6 to 1" in diameter—millions in use!

Convince yourself with a few free samples.

OVER 43 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN, PA. BOX 738

BOSTON • CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • SAN FRANCISCO

POSITION VACANT

MANAGER WANTED to take charge of mines in Southern West Virginia. The mines are new and well equipped with modern machinery. Splendid opportunity for a man with the right qualifications. Write giving details of experience to P-397, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

POSITION WANTED

MASTER MECHANIC or Chief Electrician—25 years practical experience, all types of mining equipment, machine shop and power plant. Technical training good references. PW-387, Coal Age, 330 W. 42nd St., New York 18, N. Y.

WORK WANTED

LABORERS: COAL miners supply any number with camp equipment looking for work. Will take any kind of job. Also: Will invest money in boarding house or any coal mining business if necessary. Mancuso, 251 Bowery, New York. Phone GRamercy 7-8575.

BUSINESS OPPORTUNITIES

Western Pennsylvania 900 Acres
Of land approximately 500,000 tons of coal (possible to buy adjoining acreage of coal). Mine opened and railroad siding available—also oil and gas lease $25,000. Write BO-372, Coal Age, 330 W. 42nd St., New York 18, N. Y.

Automatic Electric Mine Doors,
New Invention Pat. No. 2,376,638. Doors transversely across track operates by simple trip rail with approximately 1" movement. Weight open doors: Closed by Electric Motor. Red & green lights for safety. Need manufacturer to develop, and place in mines on rental basis. BO-398, Coal Age, 330 W. 42nd St., New York 18, N. Y.

Coal Mine—New Castle Area
112 acre lease; modern equipped, ready for production; near Route 422; complete price $8000. Apple Company, Brokers, Cleveland, Ohio.

WANTED

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

LOCOMOTIVES

Goodman: All 250 volts.
1—6 ton, 30B, 43" 1—5 ton.
1—5 ton, W-1-2, 36".
2—5 ton, 2600 K.
2—6 ton, 33-1-4-T.
2—8 ton, 32-1-4-T.

Westinghouse: All 250 volts.
1—4 ton 902, 48" with crabs.
4—904 c. 44" 500 volts and 250 volt. Also 906 motors and 102-904-115.
Bar steel frames 10 ton, 6 ton, and 4 ton.

G.E.: All 250 volt
6 ton 803, 44" as is
6 ton 823, 44"
6 ton 801
8 ton 839
4 ton 1022, 44", as is
5 ton 825, 44" & 36" 8 ton 839 motors
Battery Locomotive, Ironton, Whitcomb and 1½ ton Mercury.

Jeffrey: 6 ton and 4 ton, all gauges. 250 volt. 8 ton, 250 and 500 volts, 10 ton, MH78, 500 volts.

MINING MACHINES

Jeffrey: 28A, 250 V, 4—29B, 29C, 29CE with shearing head. Also 1 on cats. Revolving head for 29C.

Goodman: 12A, 12AB, 12AA, 12G3A, 24B.
1—12G3, 220 volt and 2—142 DA, 500 volt.
2—Permissible Type 12CA. 6—112AA. Motors for 212AA, both 250 and 500 v.
1—Hitch Cutter for Cross Head timbers.

Sullivan: CE7, CE9, CE10, CR10 Low Vein.

SUBSTATIONS — 275 volts, D. C.

1—300 KW **Westing.** Rotary.
1—150 KW **West.** Rotary.
1—200 KW 1—100 KW **Ridgway** M-G Sets.
1—200 KW **Westinghouse** M-G Set 900 RPM. 2300-270 volt.
1—100 KW **Westinghouse** M-G Set.

SPARE ARMATURES

Jeffrey MH 110, MH 78, MH 73, and MH 64-350 Volts and 500 V. 29B, 35B and 28A. **Goodman** 34B, 30B, 30C, 12A, 2600 K and R; 12AB, 12AA, 33-1-4-T, 31-1-4-T, 32-1-4-T. **General Electric** 801, 803, 807, 819, 821, 825, 839. **Westinghouse** 904, 905, 906, 102, 907. YR2, 115. Also 200 KW **Westinghouse Rotary Converter Armature,** 250 V Bracket Type, 150 KW G.E., HCC Bracket Type. **Sullivan** CE6, CE7, CE9 and CE10.

AERIAL TRAMWAYS • HOISTS • PUMPS • MOTORS • TRANSFORMERS • BOND WELDERS • RESISTANCE • COMPRESSORS • DUMPS • SPEED REDUCERS • FIELD FRAMES • GOODMAN HYDRAULIC • SHOVELS • MOTOR STARTERS AND CONTROLLERS—AC & DC • DROP BAR SUPPORTS (Gooseneck), 29B and 29C • MINING MACHINE TRUCKS • SWITCHBOARDS • CIRCUIT BREAKERS—AC & DC • COAL CRUSHERS (double roll 12"x16", (single roll) 24"x36", 24"x24" • LATHES, SWITCHES • AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps • MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps • HOISTS, overhead, AC 3-60-440 1 ton and 2 ton • 1 clam shell bucket 1¾ cubic yard • MINE CARS • 2 SULLIVAN BIT SHARPENERS • R. R. SWITCHES 85# to 100# GENERATORS DC 250-275 volt, 30 KW to 100 KW. Also SPARE MOTORS DC and AC for mining machines and locomotives. BELT CONVEYORS, SLATE, LARRY, 2—5BU on Cats. 1—8BU on Cats. 2—Myers-Whaley, #3 and #4 Automatic and other loaders. DIESEL POWER PLANTS, 50 KW to 250 KW, 3—75 KVA and 9-100 KVA 44000 to 2300 Volt G. E. transformers.

GUYAN MACHINERY COMPANY, Logan, W. Va.

SYNCHRONOUS ROTARY CONVERTERS

Qu.	KW	Make	Speed	D.C.V.
1	500	Whse.	1200	600
1	300	Whse.	1200	275
2	300	Whse.	1200	600
2	175	Whse.	1200	275

TRANSFORMERS

1—200 KVA Kuhlman, Cont. Duty, Auto, 3800-2300/3/60
3—37½ KVA Pitts, Cont. Duty, Auto, 6900-2300/1/60

MOTORS

1—80 HP, 1200 RPM, Cr. Wh. 220/440/3/60 Ind.
1—75 HP, 1800 RPM, U. S. Line Start 220/440/3/60 Ind. B.B.
1—65 HP, 1200 RPM, G.E. type KT 220/440/3/60 Ind.
1—65 HP, 1200 RPM, G.E. type KT, 440/3/60 Ind.
1—40 HP, 900 RPM, Whse, type CW, 440/3/60 Slip Ring
5—5 HP, 2200 RPM, Reliance, Ex. Proof, 230 V. D.C.
Several Whse. type SK, 230 V. DC.
A Few 5, 7½, 10, and 15 HP, New TEFC and standard open ball bearing AC motors available Across line and reduced voltage starters

Electrical Equipment

C. B. LOCKE CO.
P. O. BOX 3227
TEL. 38-136
CHARLESTON, W. VA.

NEW and REBUILT

Converters, Motor Generator Sets, A. C. & D. C. Motors, Control Equipment and Transformers. We build equipment to fit your requirements. Over 25 years engineering background.

MOTOR GENERATOR SETS

1—200 KW G.E. 1200 RPM, 250 V. DC to 300 HP, 2300/4000 volt Syn. motor AC, complete with control equipment.
1—150 KW, Ridgeway, 900 RPM, 250 V. DC to 225 HP, 2300 volt Syn. motor AC, complete with control equipment.

For Sale—

SHASTA DAM AGGREGATE PLANT AND CONVEYOR EQUIPMENT

INCLUDING:

LATE MODEL GE MOTORS, 200 HP. 1800 RPM., 2300/4000 VOLT, SLIP RING; COMPLETE WITH INTERLOCKING CONTROLLERS.

WESTERN GEAR REDUCERS, 200 HP., 40 TO 1 RATIO, HERRINGBONE GEARS.

DORR HYDROSEPARATOR, 20' x 4', COMPLETE WITH DRIVE UNIT.

8", 16" AND 20" DEEPWELL TURBINE PUMPS AND ONE 3" x 4" TWO STAGE HIGH HEAD CENTRIFUGAL PUMP, ALL COMPLETE WITH MOTORS.

30" BODINSON TRIPPER AND TRESTLE.

MISC. ELECTRICAL EQUIPMENT AND SUPPLIES.

COLUMBIA CONSTRUCTION CO., INC.
Box 579 **Redding, California**

COAL CUTTING MACHINES

1—35B Jeffrey Shortwall 250 V. D.C.
1—35BB Jeffrey Shortwall A.C.
2—29C Jeffrey Arcwall 250 V. D.C.
1—124 EJ Goodman Slabbing 250 V. D.C.
1—36B Jeffrey Longwall 250 V. D.C.
1—12G3 Goodman Shortwall A.C.

LOCOMOTIVES

1—3½ Ton Trolley Locomotive.
1—5 Ton Goodman with 2 Type 41 250 V Motors.
1—5½ Ton Iron Storage Battery Locomotive.
1—6 Ton Jeffrey with MH88 250 V. Motors.
1—6 Ton G.E. Storage Battery Locomotive with 2 HM825 Motors.

ELECTRIC MOTORS

1—400 HP Allis-Chalmers SC 3/60/2200/1150
1—185 HP Burke SC 3/60/2200/1150.
2—100 HP Ridgway 2 Speed Squirrel Cage Motors 720/360 RPM, 3/60/2200 V.
1—75 HP G.E. Type I Form M Slipring 3/60/440/720.
1—40 HP Westinghouse CS 1800 RPM.
1—30 HP Westinghouse CS 900 RPM.
1—30 HP Westinghouse CS 1800 RPM.
2—30 HP G.E. KT 1200 RPM.
1—30 HP G.E. KT 900 RPM.
1—25 HP Westinghouse CS 1200 RPM.

COAL CRUSHERS

1—36" x 36" Jeffrey S. R. Coal Crusher Gear Drive.
1—18" x 18" Same Except Belt Drive.

Tippins Machinery Company
1001 Washington Boulevard
Pittsburgh 6, Pa.

1—20 ton gas mechanical Davenport standard gauge with AAR couplers and full air-brakes 1942 model.

1—8 ton Whitcomb standard gauge with coupler and air-brakes.

These locomotives are next thing to new in appearance and performance and our price is about half new price.

A. L. GUILLE
716 Boush Street
NORFOLK 1, VA.

FOR SALE

COMPRESSOR & GENERATOR

ONE Ingersoll-Rand Cross-Compound Air Compressor, Class ORD-3, 125 lbs. steam pressure. Delivers approximately 2085 cu. ft. of air per minute at 105 lbs.

ONE Ridgeway 4-Valve Corliss Unaflow Steam Engine rated 395 hp. at 125 lbs. steam pressure. Direct connected to 300 K.V.A. Ridgeway Alternator, design No. 283, 440 volts, 3 phase, 60 cycle, 361 amps per terminal. Complete with direct-connected exciter, three-panel switchboard, oil switches and Westinghouse voltage regulator.

Above equipment is all in good condition and can be seen in operation at our plant until May 1st.

VULCAN IRON WORKS
WILKES-BARRE, PA.

STOKER UNIT

Skelly Stoker unit, moving grate. 150 H.P., Hopping having coal capacity of 875 lbs. (675 lbs. per hour) Used 6 months.

457 W. 57 St. N. Y.

FOR SALE

1—100 foot steel base 16" belt conveyor—Good condition.

E. M. WILLIAMS
P. O. Box 410 **Spartanburg, S. C.**

REBUILT EQUIPMENT—READY TO SHIP

MOTOR GENERATOR SETS

1—150 KW. 500 v. compound wound Ridgway Generator 273 amps. 900 rpm. direct connected to a 225 HP. 2200 v. 3 ph. 60 cy. Ridgway synchronous motor.

1—30 KW. 125 v. 825 rpm. type S generator direct connected to a 50 HP. 825 rpm. type S 500 v. Motor.

1—40 KW. 1200 rpm. 125 v. 320 amp. G.E. Generator direct driven by a 65 HP. 60 cy. 1200 rpm. 2200 v. Motor.

1—65 KW. 125 v. DC General Electric Generator direct driven by a 100 HP. 2200 rpm. 2300 v. 3 ph. 60 cy. Motor.

1—100 KW. 900 rpm. 550 v. Westg. Generator coupled to a Westg. 2300 v. 3 ph. 60 cy. synchronous motor.

DIESEL ENGINE GENERATOR SET

1—100 KW. 120/240 v. 1200 rpm. DC Delco Generator driven by 150 HP. 1200 rpm. Superior Diesel Engine.

PUMPS

1— 11 GPM 460 ft. head Worthington Oil Pump.
1— 60 GPM 479 ft. head Gould Pump.
1—100 GPM 50 ft. head Dayton Dowd Pump.
1—130 GPM 50 ft. head Dayton Dowd Pump.
1—160 GPM 50 ft. head Dayton Dowd Pump.
1—220 GPM 231 ft. head 3½"x3" Blackmer Pump.
2—243 GPM 100 ft. head Dayton Dowd.
1—300 GPM 90 ft. head Dayton Dowd Pump.
3—378 GPM 44 ft. head Dayton Dowd.
1—1500 GPM 90 ft. head Allis-Chalmers Pump.
1—3500 GPM 90 ft. head DeLaval Pump.
1—4000 GPM 138 ft. head Ingersoll Rand Pump.
1—450 GPM 104 ft. head Dayton Dowd Pump.
1—550 GPM 88 ft. head Dayton Dowd Pump.
1—500 GPM Morris Machine Wks. 4" sucs. 4" dis. 123" head 1760 rpm.
3—750 GPM 70 ft. head Dayton Dowd Pumps.
1—1000 GPM 45 ft. head Allis-Chalmers Pump.

230 V. DC MOTORS

HP	Make	RPM	Type
30	Westg.	700	S-6
25	G.E.	650	MD
20	Westg.	600	M
20	Westg.	1100	SK
20	Westg.	975	S
15	Westg.	560	S-7
15	Al. Ch.	800	
15	G.E.	1100	CE
13½	Al. Ch.	700	
13	Cr. Wh.	1100	CM
10	Cr. Wh.	675	CCM
10	Cr. Wh.	825	CM
10	Westg.	650	S
8	G.E.	950	RC-11
1–7½	Westg.	975	S-3
5	Westg.	400	SK

ALTERNATING CURRENT MOTORS
3 ph. 60 cy.

HP	Make	Type	Volts	RPM
50	Cr. Wh.	Sq. Cg.	440/220	505
75	Westg.	CS-Sq. Cg.	440/220	900
75	Westg.	CS-Sq. Cg.	440/220	720
100	Westg.	CS-Sq. Cg.	440/220	1200
100	Westg.	CS-Sq. Cg.	440/220	900
100	Westg.	CS-Sq. Cg.	440/220	720
100	Cr. Wh.	Sq. Cg.	440/440	720
125	Westg.	CS-Sq. Cg.	440/220	1200
125	Westg.	CS-Sq. Cg.	440/220	900
125	Westg.	CS-Sq. Cg.	440/220	720
150	Westg.	CS-Sq. Cg.	440/220	900
150	Westg.	CS-Sq. Cg.	440/220	720
175	Westg.	CS-Sq. Cg.	440/220	1200
180	G.E.	I-Sq. Cg.	2200	1170
200	Westg.	CS-Sq. Cg.	220/440	1200
200	Westg.	CS-Sq. Cg.	440/440	900
200	Westg.	CS-Sq. Cg.	440/220	505
200	Cr. Wh.	SR-Slprg.	440/220	505
200	Al. Ch.	Slprg.	440/220	500
200	Westg.	CW-Slprg.	440/220	350
250	Westg.	CS-Sq. Cg.	440/220	720

Note: LARGE STOCK OF SMALL MOTORS—AC and DC.

22	G.E.	Slprg.	220	1200
100	Finn-Welschel	31-V-RN Sq. Cg.	220	900
300	G.E.	I-Slprg.	2200	585
350	Allis Ch.	ANY-Slprg.	440	514
400	Westg.	CW-Slprg.	2200	435
450	Cr. Wh.	SR-Slprg.	2300	392
800	G.E.	MT-Slprg.	2200	443

COMPRESSORS

2—315 CFM Ingersoll Rand portable 100# pres. driven by 105 HP Waukesha Oil Engines, 860 rpm.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

ROTARY CONVERTERS

500 KW G.E. SYN., 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.

300 KW G.E. SYN., 575 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.

MOTOR GENERATORS

150 KW G.E. SYN., 275 V., 2300 V., 3 Ph., 60 Cy., 900 RPM, Manual Switchgear.

150 KW G.E. SYN., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Manual Switchgear.

LOCOMOTIVES

13-T WESTGHSE., 250 V., 908-C Mts., 36"-44" Ga.
13-T Gen. Elec., 500 V., HM827 Mts., 36"-42" Ga.
13-T Gen. Elec., 250 V., HM827 Mts., 36"-42" Ga.
10-T JEFFREY, 250 V., MH110 Mts., 36"-48" Ga.
10-T JEFFREY, 250 V., MH-110 Mts., 44"-48" Ga.
10-T WESTGHSE., 500 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHSE., 250 V., 907-C Mts., 36"-44" Ga.
8-T WESTGHSE., 500 V., 907-C Mts., 42"-48" Ga.
8-T WESTGHSE., 250 V., 906-C Mts., 42"-48" Ga.
6-T JEFFREY, 250 V., MH-88 Mts., 42"-48" Ga.
6-T WESTGHSE., 250 V., 903-C Mts., 22"-30" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY
INCORPORATED
501 Grant Building, Pittsburgh, Pa.

FLORENCE MACHINERY & SUPPLY CO.
REBUILT COAL MINING EQUIPMENT

PIT CARS

100—1 Ton R.B. Card, 36" Ga.
74—1 Ton P.B. Card, 36" Ga.

LOADERS

1—Manierre Type Box Car Egg Loader
1—7-BU Joy Loader, 250 Volts DC

SHAKER SCREENS

1—Double Deck, Lower deck 8'x28', upper deck 36" x 40'

STEEL BINS

2—10'x20'—3/16" Steel
1—16'x24'—Sectional

GENERATORS

1—100 KVA West. Syn. Motor, 2300 Volts AC
1—96 KW, 2300 Volts AC, direct connected to a 14x17 Chuse Engine
1—25 KW Crocker-Wheeler, 250 Volts DC
1—15 KW Ft. Wayne, 480 Volts AC

HOISTS—ELECTRIC

1—200 H.P. Double Drum Elec. Hoist with Motor
1—25 H.P. H&B Electric Hoist, with Motor
1—50 H.P. Hoist, with 250 Volt DC Motor

PUMPS—PYRAMID

2—3x4½ Goulds, Fig. 1813 with 1½ H.P. Motors
1—3x4½ Goulds, Fig. 1813, with ¾ H.P. Motor
1—3x3 Deming, Fig. 809, with 3 H.P. Motor

COAL CUTTERS

3—Sullivan CE-7 A.C. Coal Cutters, with Tip-Turn Trucks, with new Bowdil Cutter Chains & Feed Chains

MISCELLANEOUS

2/0 & 4/0 Insulated Wire 20# Plate Frogs & Switches
Electric Mine Gongs
Valves & Fittings
Wheelbarrows
1—18" Drag Chain Conveyors, 7' Centers, with 1 H.P. Motor & Speed Reducer

We have a complete stock of practically everything

904 EQUITABLE BLDG. **DENVER 2, COLORADO**

Yards: Denver and Florence, Colorado

WESTINGHOUSE
TYPE SK—MOTORS
America's Best Stock
WIRE INQUIRIES COLLECT

MOTORS, GENERATORS, TRANSFORMERS

1—150C H.P.
Bought and Sold
New and Rebuilt

ELECTRIC EQUIPMENT CO.
Rochester 1, N. Y.

FOR SALE

COPPER TROLLEY WIRE 4/0 Round and Grooved. Also 3/0 and 2/0

COPPER FEEDER WIRE 250,000 300,000, 500,000, 750,000 CM Bare and Insulated

DROP BOTTOM MINE CARS 48" Gauge

2 LOCOMOTIVE CRANES, 20 Ton Capacity, Standard Gauge—50 Ft. Booms—Excellent Condition—Bargains for quick sale

NEW FABRICATED LANDING MATS for re-inforcing, fence, mine roadways for shuttle cars, etc.

MANSBACH METAL COMPANY

Logan, W. Va. Phone 1071

FOR SALE

ATTRACTIVELY PRICED • IMMEDIATE DELIVERY

ALUMINUM SHEETS

	Approx. Quantity	Gauge and Size	Description	
1.	36,462 #	.156 x 48" x 144"	Type 24ST Alclad	68 boxes — 334 sheets
2.	2,944 #	.156 x 48" x 96"	Type 24ST Alclad	2 boxes — 40 sheets
3.	4,148 #	.156 x 48" x 144"	Type 24ST Alclad	4 boxes — 38 sheets
4.	15,650 #	.182 x 36" x 144"	Type 24ST Alclad	6 boxes — 156 sheets
5.	63,424 #	.187 x 48" x 144"	Type 24ST Alclad	121 boxes — 484 sheets
6.	162 #	.187 x 36" x 120"	Type 24ST Alclad	1 box — 2 sheets
7.	1,046 #	.187 x 48" x 144"	Type 24 SO Alclad	2 boxes — 8 sheets

ALUMINUM TUBING

8.	12,358 #	5/16" OD x .120 wall x 11' lengths	Type 24ST
9.	39,224 #	1–1/2" OD x .049 wall x 8 to 12' lengths	Type 3S, full hard
10.	1,000 #	1–5/8" OD x .058 wall x 8 to 12' lengths	Type 24S, full hard
11.	5,455 #	2–3/4" OD x .058 wall x R/L	Type 61S, soft
12.	6,635 #	2–3/4" OD x .058 wall x 11' lengths	Type 61SO

COPPER TUBING (Seamless)

13.	3,606 ft.	6.625" OD x .109 wall x approx. 20' lengths	Spec. 44–T–12C

STEEL ROUND BARS

14.	12 tons	31/32" dia x 12' lengths	CF x 1335 analysis
15.	70 tons	1–3/8" dia x 16' lengths	CF SAE 1122 analysis
17.	41 tons	2–1/16" dia x 15' lengths	CF Screw stock
18.	17 tons	2–1/2" dia x 16' lengths	CF Screw stock
20.	100 tons	1–1/2" dia x 10' lengths	CF-X 1314 analysis

ALLOY STEEL SHEETS

21.	896 #	.0313 x 18" x 72"	SAE 4130
22.	5,148 #	.038 x 18" x 72"	SAE 8630
23.	2,325 #	.042 x 18" x 72"	SAE 4130

INCONEL SHEETS

24.	39,930 #	.031 x 44" x 65"	AN–271

STAINLESS - STEEL TUBING and WIRE

25.	9,223 ft.	1–3/4" OD x .148 wall x 11' lengths	Type 304
26.	800 ft.	2.84" OD x .266 wall x 11' lengths	Type 430
27.	564 lbs.	.091 ga x coils from 17 # to 50 # ea.	Type 316, spring temper

SAMPLES OF ANY ITEMS WILL BE SUBMITTED UPON REQUEST

DULIEN STEEL PRODUCTS, INC.

233 Broadway BEekman 3-3041 New York 7, New York

Member of Association of Steel Distributors

SURPLUS MINING EQUIPMENT

MINE HOISTS

24" x 60" Nordberg duplex, direct connected, reversible steam hoist with cylindro-conical drum, grooved for 5000 ft. 1¼" wire rope.

32" x 72" Nordberg duplex, direct connected, reversible steam hoist with cylindro-conical drum, grooved for 6000 ft. 1¼" wire rope.

10" x 12" Lidgerwood duplex geared hoist, with 53" diam. x 48" face drum, grooved for 550 ft. 1" wire rope, 4500 lbs. capacity.

AIR COMPRESSORS

Nordberg two-stage, non-condensing compressor,
steam cylinders, 19 x 34 x 44
air cylinders, 25 x 38 x 44
Capacity 3744 cfm.

Nordberg quadruple expansion, two-stage compressor,
steam cylinders, 14.5 x 22 x 38 x 54 x 48
air cylinders, 23 x 23 x 37 x 37 x 48
Capacity 9000 cfm.

COPPER RANGE COMPANY

DRAWER 232, HOUGHTON, MICHIGAN

LOADING MACHINES

7—L-400 Jeffrey, 250 volt.
5—7-BU Joy, 250 volt.
15—5-BU Joy, 250 volt.
3—#3 Myers-Whaley, 250 volt.

REBUILT LOCOMOTIVES

2—13-ton Goodman, 36-B, 250 volt.
1—10-ton G. E., HM-930, 250 volt.
3—10-ton Goodman, 34-B, 250 volt.
3—20-ton Jeffrey, MH-77, 500 volt.
2—20-ton G. E., HM-824, 500 volt.
6—8-ton Goodman, flame proof, 500 volt, 91C motors.

MINING MACHINES

12—7-B Sullivan, 250 volt. Four years old.
22—35-B Jeffrey, permissible type, 500 volt.
15—112-AA and 12-AA Goodman, 250 volt.
15—12-G3 Goodman, 220/440 volt AC.

COAL WASHER AND TIPPLE

1—Link-Belt late type steel tipple, capacity 300-ton per hour with coal washer capacity 200-ton per hour.
Other 3, 4 and 5-track steel tipples.

HOISTS

Several shaft and slope hoists——200 to 1000 H.P. motors.

COAL MINE EQUIPMENT SALES COMPANY

306-7 Beasley Building Terre Haute, Ind.
Phone - LD-34

FOR SALE

NW-6 Shovel & Drag. 1942 machine
NW-80D Shovel & Dragline
NW-95 Dragline
NW-105 Shovel & Dragline
Lorain-95 Dragline Diesel (like new)
Lorain 77 Shovel. Cat diesel
Lorain 79 Shovel & Drag.
Lorain 60 Crane
P & H 1055 Dragline (6 month)
Lima 802 Shovel & Drag. NEW
Lima 1201 Dragline Diesel
Lima ¾ yd. Paymaster NEW

B-E. 43B Shovel. gas. 12,500.00

B-E. 44B Shovel & Drag. NEW
B-E. 54B Dragline only
Marion 371 Dragline
9W Monighan Walking Drag. 100' boom
12 Euclid End Dumps 11.7 cy Diesel
12 Maxi End Dumps 11.7 cy. H-S. Butane eng.
315 CFM. Ingersoll Rand Compressor diesel, 4 pneu.
Caterpillar D-8 Angledozer #8R4504Sp, D18 tractor
#1H6498SP, D-8 Bulldozer #2U750.

Ask us about our low cost Finance Plan

AIR COMPRESSOR RENTAL CO.

19616 Nottingham Rd., Cleveland 10, Ohio

FOR SALE

1—Wiley 50 KWDC 125 V Generator direct connected to Ridgeway Steam Engine
2—8 ton Plymouth Locomotive Model DLB with Buda gas engines. Standard Gauge
1—#2F Telsmith Reduction crusher. Shop #782
1—#10A Telsmith Primary crusher. Shop #1081

THE KENTUCKY STONE COMPANY
214 Fincastle Building
Louisville 2, Kentucky

FOR SALE

CRUSHERS

1—Stephens Adamson 30 x 30 double roll crusher. Will crush from 20" down to 1¼".

1—Link Belt 36 x 60 double roll crusher equipped with gear drive.

1—24 x 36 McNally Pittsburg crusher, single roll, #9-36-335, maximum feed size 16", capacities 100 TPH 1¼", 190 TPH 4", 290 TPH 8".

FAN

1—Bayley #17 Plexiform fan, type F, wheel diameter 93½", circumference 24.478 ft. outlet area 39.376 sq. ft. Capacity ranges from 39376 CFM at outlet velocity of 1000 to 141750 CFM at outlet velocity of 3600.

MOTOR GENERATOR SET

1—50 KW GE motor generator set, generator #416847, 182 amps, 250 volts, Form A, DLG 203, Motor type 1-6-75-1200, Form K, 60 cycles, 220 volts, 75 HP, 180 amps, speed full load 1165 rpm, speed no load 1200 rpm. Complete with compensator #1083666, Form A2, type 1633, primary volts 250, secondary 881137 and switchboard #26654, 250/275 volts, 20 amps.

HOIST

1—Ottumwa silent chain drive hoist, drum inside face 30", inside flange 7", drum diameter 36", 90 teeth on big gear, 25 teeth on pinion gear, overall length 7' 9", overall width 9', overall height 5' 6", complete with 40 hp General Electric slip ring motor, 3 phase, 60 cycle, 220 volts, 900 rpm, with reversible controller and resistance. Rope speed 290' per minute. 130 teeth on chain drive gear, 16 teeth on motor pinion.

LOCOMOTIVES

1—4 ton Goodman locomotive, type 75AO4T, #5050, overall length 15' 10" width 47", height 32", wheelbase 44", gauge 28". Gauge can be changed to 24", or 42". Ball bearing motors and journals, 250 volts, DC, continuous strip grids, equalizers, and spring bumpers.

1—5 ton Goodman locomotive type W-1-2A5, #963 overall dimensions, length 11', height 30", width 47", wheelbase 31", 42" gauge.

1—5 ton General Electric locomotive, classification LM-2T5-DD, serial number 6274, 250 volts DC, 36" gauge, 45" wide overall, 30½" frame height, overall height 36", 44" wheelbase, 24" wheel diameter, 12'6" long bumper to bumper, R86E type controllers.

3—6 ton General Electric locomotives, classication LM-2T6-MM5, serial numbers 6523, and 5837, 250 volts DC, 36" gauge, 45" wide overall, 33" frame height, 38½" overall height, 44" wheelbase, 30" wheel diameter, 13' long bumper to bumper, R86E type controllers.

1—6 ton Goodman locomotive #4976, type 13314T, 250 volts, ball bearing motors, 42" gauge, wheelbase 44", length 14', width 54", height 35½".

PUMPS

2—Gould pumps 6 x 12, #506477, fig. 1531, 4" suction, 4" discharge, with 7½ HP motors, 175 ft. head, 114 gallons per minute.

1—Gould Centrifugal pump 3" suction, 2" discharge, capacity 225 GPM, at 105' head, complete with 10 HP Westinghouse motor, 3 phase, 60 cycle, 220/440 volts, 1750 rpm, and magnetic starter.

MINING MACHINES

1—Sullivan shortwall mining machine CE7, AC, 3 phase, 60 cycle, 220 volts, 44" gauge, 6½ ft. cutter complete with tip turn truck.

2—Sullivan Longwall mining machines, 3 phase, 60 cycle, 220 volts, AC, type CH8, 30" cutter bars, complete with 300 ft. each of 3 conductor mining machine cable.

We are distributors for John A. Roebling Sons Company wire rope and fittings.

GAVENDA BROTHERS

CANTON, ILLINOIS

FOR SALE

1—43-B Bucyrus Electric Shovel, with 2 yd dipper. Long tracks, 30" shoes; 26' boom, 17' handle. Single motor 3/60/2300 volts. In operating condition. With $3,000 new spare parts.

1—750-B P&H Electric Shovel, with 2 yd dipper. Long tracks, 30" shoes; 26' boom, 17' handle. Single motor 3/60/2300 volts. In operating condition. With $1,500 new spare parts.

Can be converted to Diesel drive.

C. B. SKINNER COMPANY

816 Howard Ave. New Orleans 5, La.

WANTED TO BUY

LOCOMOTIVE

1 used Goodman 32A-0-4-T.2, 8 tons, 42" Locomotive.

HANLEY CO.

Summerville, Penna.

FOR SALE

COAL CRUSHER

AMERICAN PULVERIZER

Type A. C. Serial No. 2258

Complete with V-Belt Sheave

Excellent condition - Immediate delivery

MIDWEST-RADIANT CORPORATION

220 North Fourth St., St. Louis, 2, Missouri

FOR SALE

8—G12½ Goodman Room Shaker Conveyors.
1—15 Goodman Room Shaker Conveyor.
2—G20 Goodman Mother Shaker Conveyors.
8—12 C.A. Goodman short wall mining machines. 250V-42" gauge.

All rebuilt. Fine condition.

WEST VIRGINIA MINE SUPPLY COMPANY

Clarksburg, West Virginia

WANTED

FOR SALE

DRAGLINES

2—Class 230 Steam Bucyrus-Erie Draglines; 175 ft. boom; 8½ yd. bucket; machine and tracks in first-class condition. Machines located on river near New Orleans and can be shipped by water without dismantling.

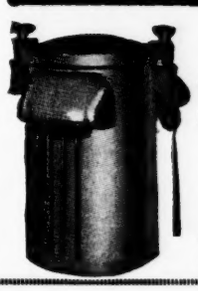
EACH $50,000.00

WALTER P. VILLERE COMPANY

1100 So. Claiborne Avenue

New Orleans 13, Louisiana

-TRANSFORMERS-



TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes

ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

THE ELECTRIC SERVICE CO., INC.

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"

Station M **Since 1912** **CINCINNATI 27, OHIO**

1—Main shaker shaft 6 in. Diam., 16 ft. 9 in. long with 4-21 inch x 14 inch cast iron boxes babitted and 4-15 inch Diam. cams with 4 inch face, straps and arms to match —complete for your sizeing decks $10,000.00

1—Set compound crusher rolls 29"x24" chilled steel removable segments—drive gear 48"x6" face $1,800.00

Numerous other items of coal mine and preparation equipment.

Write post office box 326
Pittston, Pennsylvania

WANTED TO PURCHASE

5 to 10 cubic yard electric powered dragline, walker preferred, 150 to 180 foot boom, must be in good condition, needed in next few months.

D. W. & R. A. MILLS LIMITED

Box 418 **Minto, N. B. Canada**

WANTED TO BUY

I Six-ton Baldwin-Westinghouse Electric Locomotive, bar steel frames outside of wheels, 904 motors, 250V, D. C., 36" gauge; I Four-ton Jeffrey Locomotive, MH 96 motors, 250V, D. C., 36" gauge; I Ten-ton Jeffrey Locomotive, MH110 motors, 250V, D. C., 36" gauge; G.E. Generator Sets with Switchboards: 100 KW to 300 KW, 250V, D. C.; 2,000'—500,000 C.M. Feed Cable."

W-400, Coal Age
330 West 42nd St., New York 18, N. Y.

WANTED

¾ to 4 yard Shovels
2 to 8 yard Draglines

FRANK SWABB EQUIPMENT CO., Inc.

HAZLETON, PA.

Telephones: **4910J and 4911**

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1946-47 MINING CATALOG

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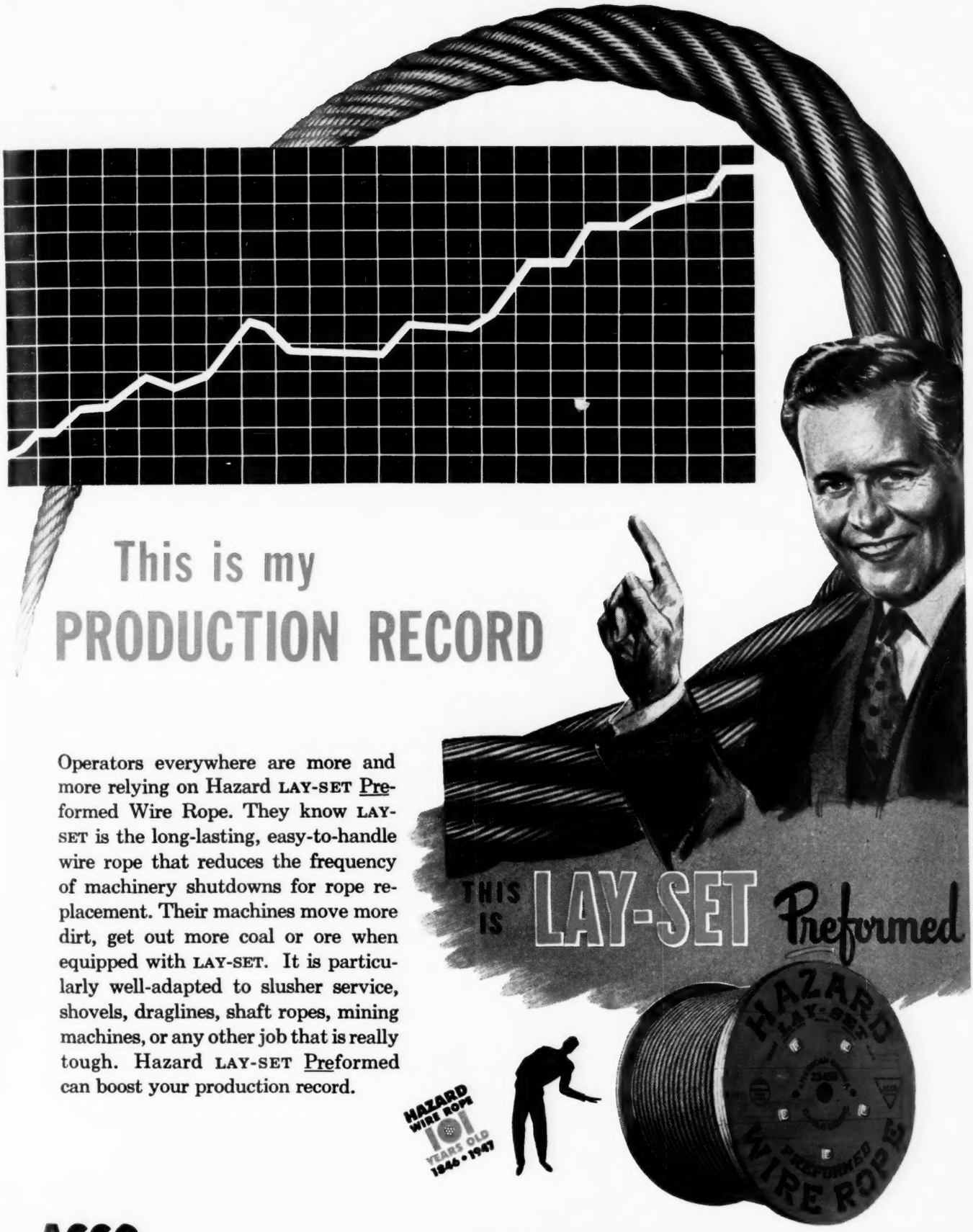
SEARCHLIGHT SECTION

Classified Advertising



Operators everywhere are more and more relying on Hazard LAY-SET Preformed Wire Rope. They know LAY-SET is the long-lasting, easy-to-handle wire rope that reduces the frequency of machinery shutdowns for rope replacement. Their machines move more dirt, get out more coal or ore when equipped with LAY-SET. It is particularly well-adapted to slusher service, shovels, draglines, shaft ropes, mining machines, or any other job that is really tough. Hazard LAY-SET Preformed can boost your production record.

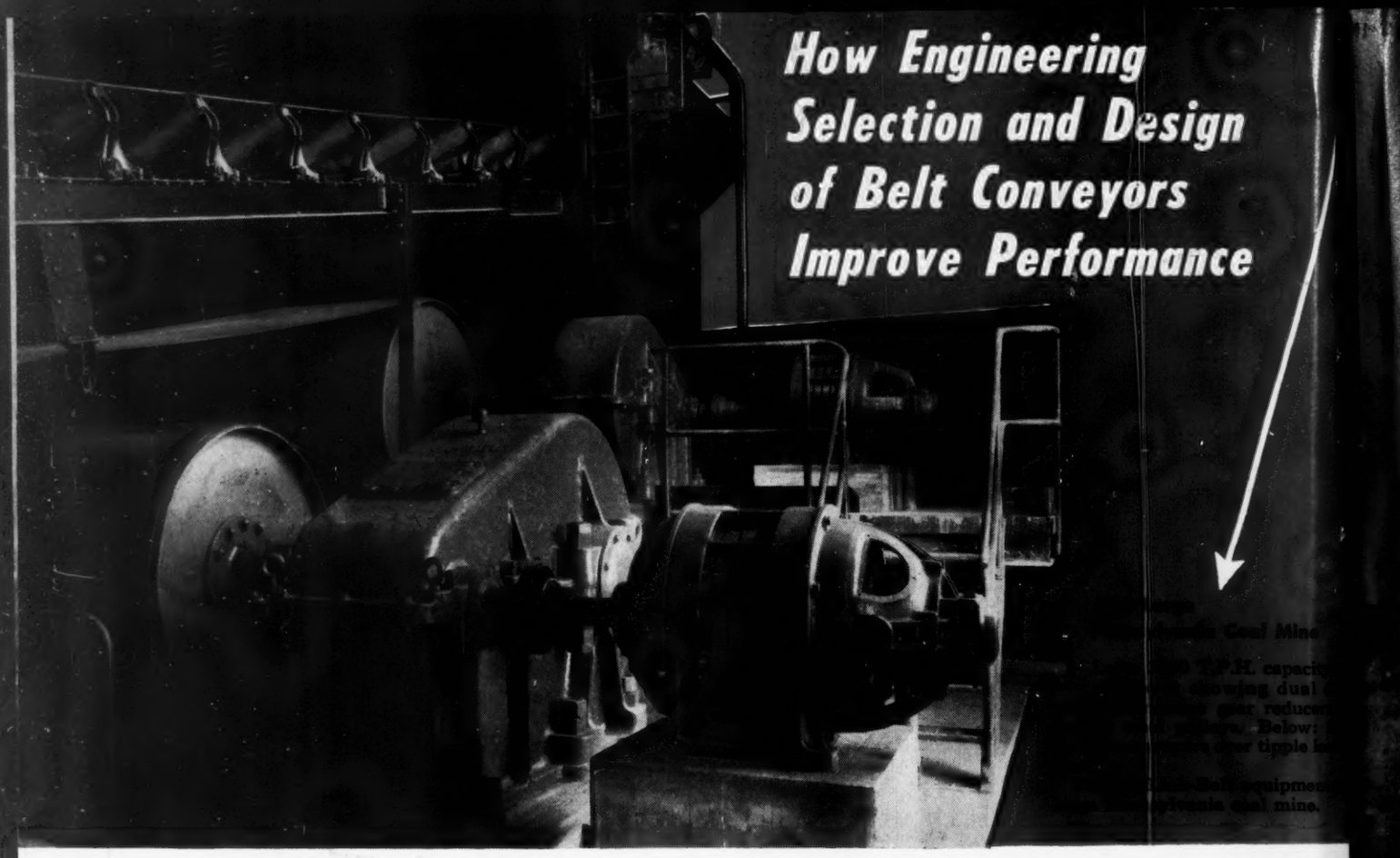
ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety



How Engineering Selection and Design of Belt Conveyors Improve Performance

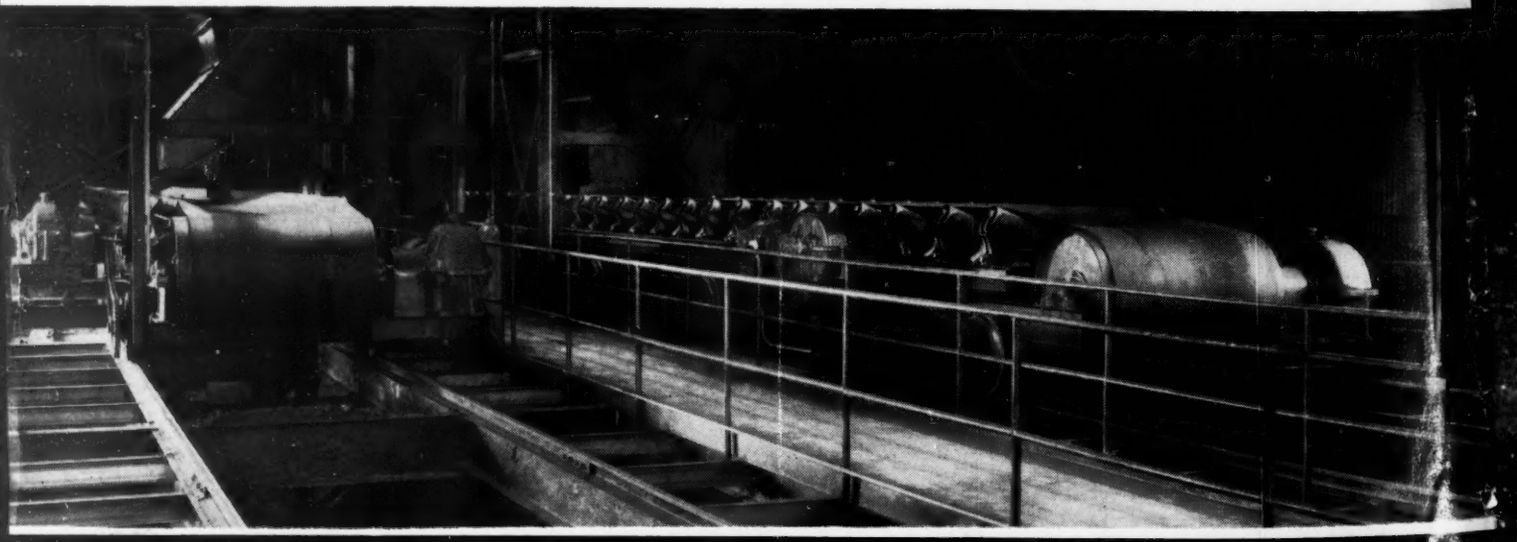
THE success of Link-Belt belt conveyor installations in raising production rates and cutting handling costs, with a minimum of maintenance, is due not only to the most advanced design and construction of Link-Belt carrying and return idlers, but also to:

- properly designed terminal drive machinery.
- efficient discharge chutes at terminal and discharge points.
- a design of welded steel pulleys that reduces shaft deflection.
- highest mechanical efficiency in speed reducers, direct coupled or chain driven.
- engineering experience to produce the proper relationship between pulley diameter and ply thickness of belt; also between size of material handled and conveyor belt width, quality of rubber covering, carcass specifications, etc.

The user gets the benefit of this experience when he selects Link-Belt belt conveyor equipment — idlers, trippers, drives, pulleys, bearings, takeups, belts.

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8. 10,531



COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT